

Report Prepared for

Van Waters and Rogers Inc.
6100 Carillon Point
Kirkland, Washington 98033

**SOIL BORING INVESTIGATION
FORMER VW&R FACILITY
BOISE, IDAHO**

HLA Job No. 09695,337.02

by

S. Michelle Watson
S. Michelle Watson
Senior Geologist

Christopher R. Smith
Christopher R. Smith
Principal Hydrogeologist

Harding Lawson Associates
7655 Redwood Boulevard
P.O. Box 578
Novato, California 94948
415/892-0821

December 19, 1991

USEPA SF



1415860

TABLE OF CONTENTS

LIST OF TABLES.....	iii
LIST OF ILLUSTRATIONS	iii
1.0 INTRODUCTION	1
2.0 BACKGROUND.....	2
2.1 Site Description and History.....	2
2.2 Site Hydrogeology	2
3.0 FIELD INVESTIGATION.....	4
3.1 Soil Borings.....	4
3.2 Laboratory Analytical Program	5
3.3 Decontamination	6
3.4 Waste Material Storage and Disposal.....	6
4.0 RESULTS	7
4.1 Hydrogeology	7
4.2 Soil Sample Analytical Results	7
4.3 Quality Assurance/Quality Control	8

TABLES

ILLUSTRATIONS

Appendices

**A BORING LOGS AND KEY TO THE UNIFIED SOIL CLASSIFICATION
SYSTEM**

B LABORATORY ANALYTICAL REPORTS

DISTRIBUTION

LIST OF TABLES

Table 1 Soil Sample Analytical Results

LIST OF ILLUSTRATIONS

Plate 1 Area Map

Plate 2 Site Plan

Plate 3 PCE Concentrations in Soil

1.0 INTRODUCTION

This report has been prepared for Van Waters & Rogers Inc. by Harding Lawson Associates (HLA) and presents the results of HLA's soil boring program at the former VW&R facility on Friedly Drive, Boise, Idaho. The scope of work and objectives of the investigation were outlined in the *Work Plan, Soil Boring Investigation, Former VW&R Facility, Boise, Idaho*, dated October 18, 1991. The objectives of this investigation were to:

- o Confirm the presence and concentration of chemical constituents detected during a soil gas survey conducted by HLA during September 1991;
- o Evaluate the potential for other volatile organic compounds to be present in soil; and
- o Provide additional soils data to assist in the design of a pilot soil vapor extraction system (VES).

To meet those objectives, HLA collected and analyzed soil samples from four soil borings drilled in the vicinity of the former VW&R facility.

2.0 BACKGROUND

2.1 Site Description and History

From approximately 1973 to 1983, VW&R operated a small distribution facility from a portion of a warehouse located on Friedly Drive, Boise, Idaho. Nielsen Transfer & Storage (NT&S) also occupied a portion of the warehouse throughout the term of the VW&R lease. The property was apparently owned by a number of people during VW&R's tenancy, including NT&S, Nielsen Warehousing Company, Monteford Brooks, and Shirley O'Rielly (a/k/a Shirley O'Rielly Crowe). VW&R reportedly stored perchloroethylene (PCE) in an aboveground storage tank at this facility. An underground petroleum storage tank (UST) was reportedly used at the site by NT&S. In approximately 1987 or 1988, the warehouse and UST were removed from the site. Today, a paved parking lot and a Pier 1 Imports store occupy the general area where the warehouse partially occupied by VW&R was located. The current address of the Pier 1 Imports store is 140 Milwaukee Avenue, Boise, Idaho (Plate 1).

2.2 Site Hydrogeology

The shallow geology in the vicinity consists of terrace gravels 50 to 150 feet thick that have been reworked and deposited by the Boise River. The terrace gravels are generally overlain by 2 to 4 feet of engineered fill. Boring logs from two monitoring wells in the immediate vicinity of the site indicate that approximately 4 to 4.5 feet of fill are underlain by very stiff clay and silt to an approximate depth of 8 to 8.5 feet. Sand and gravel underlie the clay and silt to a depth of at least 24 feet (the total depth of the well borings).

A shallow aquifer in the site vicinity is present under water table conditions at an approximate depth of 8 to 12 feet below ground surface (bgs). Localized

groundwater recharge and discharge vary seasonally. Recharge generally occurs from Ridenbaugh Canal during the irrigation season between April and October. However, localized groundwater discharge to the irrigation canals and sloughs has been observed in the area. Although the water table level and flow direction may fluctuate with the irrigation season, the predominant regional flow direction in this shallow aquifer is to the northwest.

3.0 FIELD INVESTIGATION

This soil boring program was conducted between October 21 and 23, 1991. The services included drilling four soil borings at the site and collecting and analyzing soil samples from them.

Prior to initiating field activities, access agreements were made with appropriate property owners, and utility locations were identified. Representatives of the Idaho Department of Environmental Quality (DEQ) and CH2M Hill (Pier 1/Pier Group's consultant) were present during all or some of the field activities.

3.1 Soil Borings

On October 22, 1991, HLA supervised the drilling of four soil borings at the site (Plate 2). Two borings were drilled in the vicinity of the former tank location, one was drilled at the southeast corner of the Pier 1 building, and one was drilled approximately 220 feet downgradient (west-northwest) of the former tank location. Drilling was performed under the supervision of an HLA geologist by J.D. Welsh Drilling, Meridian, Idaho, using a CME 75 hollow-stem auger rig. The borings were drilled to approximately 1 foot below the water table at depths ranging from 13.5 to 14.5 feet. Soils were classified according to the Unified Soil Classification System. The lithologic logs of the soil borings and a key to the USCS are presented in Appendix A. Soil samples were collected for lithologic characterization and chemical analysis at approximately 2-foot intervals using a 3-inch outside diameter split sleeve sampler lined with stainless steel tubes. Samples were visually inspected and screened with an organic vapor monitor (OVM) for volatile organic vapors. The OVM field measurements are included on the boring logs (Appendix A). Following field screening, the sample tubes selected for chemical analysis were sealed with plastic caps lined with Teflon,

labeled, and placed in a chilled cooler. Samples collected immediately above or below those selected for chemical analysis were retained for physical analysis. The samples were transported under chain of custody to either the HLA soils laboratory in Concord, California, for physical testing or shipped via overnight mail to ATI Laboratory, Renton, Washington, for chemical analysis. Two soil samples and two decontamination water samples were transported under chain of custody to Alchem Laboratory, Boise, Idaho, for analysis to identify appropriate disposal.

Following completion of the drilling and sampling, the borings were backfilled with bentonite chips.

3.2 Laboratory Analytical Program

Approximately three soil samples from each boring were selected for chemical analysis: one from immediately above the water table and the remaining two samples from areas exhibiting elevated concentrations of organic vapors as indicated by the OVM field readings. Samples collected immediately above or below those selected for chemical analysis were retained for grain size analysis at HLA's soils laboratory. Additionally, two soil samples exhibiting elevated OVM readings, collected from Borings B-1 at 8.0 feet and B-2 at 8.5 feet, were submitted to Alchem Laboratory, Boise, Idaho, for 24-hour turnaround analysis to identify soil disposal options.

Soil samples were analyzed for volatile organic compounds using EPA Test Methods 8010/8020 or 8021, total petroleum hydrocarbons using EPA Test Method 8015 (modified), moisture content using CLP SOW ILM01.0, and grain size using ASTM Method D-422.

3.3 Decontamination

To minimize the possibility of cross contamination, all drilling and sampling equipment was decontaminated prior to and after use. The augers were steam cleaned prior to transport to the site and after completion of the drilling. Clean augers were used to drill each boring. Soil sampling equipment was washed with nonphosphate detergent and water, and then double rinsed with water. All cleaning fluids were appropriately contained during and after use.

3.4 Waste Material Storage and Disposal

Soil cuttings and rinseate were contained and characterized. Water samples were collected from each drum of decontamination water, and analyzed on a 24-hour turnaround basis by Alchem Laboratory. Pursuant to approval from Walla Walla Shopping Center Associates and the DEQ, the wastewater was treated at the Walla Walla Shopping Center Associates' groundwater treatment system under the supervision of HLA and Special Resource Management, Inc., Walla Walla's consultant.

The drummed soil cuttings were properly transported by Van Waters & Rogers Inc. to Omaha, Nebraska, for temporary storage prior to incineration at Rollins, Deer Park, Texas.

4.0 RESULTS

4.1 Hydrogeology

Lithologic data obtained from borings drilled by HLA during this investigation indicate that approximately 3 to 4 feet of fill are underlain by silt, clay, or clayey sand to an approximate depth of 7.5 to 9 feet. Sand and gravel underlie the silt and clay to at least 13.5 to 14.5 feet, the maximum depths of the borings.

Groundwater was encountered in the borings at depths ranging from 12.5 to 14.5 feet.

4.2 Soil Sample Analytical Results

The results of soil sample analyses are summarized in Table 1 and copies of the laboratory reports are included in Appendix B.

The highest concentrations of chemicals were detected in samples collected from Borings B-1 and B-2, drilled in the immediate vicinity of the former tank location.

PCE was detected in all soil samples at concentrations ranging from 0.014 to 26,000 milligrams per kilogram (mg/kg). Trichloroethene (TCE) was detected in four samples collected from Borings B-1 and B-2 at concentrations ranging from 0.4 to 3.1 mg/kg. Methylene chloride was detected in all but two samples at concentrations ranging from 0.16 to 1.1 mg/kg. Carbon tetrachloride was detected at a concentration of 0.18 mg/kg in the sample collected from Boring B-1 at 9.5 feet. Cis-1,2 Dichloroethene was detected in three samples collected from Borings B-1 and B-2 at concentrations ranging from 0.014 to 1.3 mg/kg. The soil sample collected from Boring B-3 at 8 feet contained 1,1,1 trichloroethane at a concentration of 0.016 mg/kg.

TPH were not detected in any of the samples. Moisture contents ranged from 3.5 to 18 percent.

4.3 Quality Assurance/Quality Control

The accuracy of the ATI Laboratory data was assessed by evaluating internal (laboratory) spike recoveries for each field sample. Spikes consisting of bromochloromethane and bromofluorobenzene were added to each field sample. Accuracy was generally good. However, three samples were out of the acceptable surrogate percent recoveries for bromochloromethane: 91102209 (B-1 at 13.5 feet), 91102211 (B-2 at 4.5 feet), and 91102215 (B-2 at 9.0 feet). Because the bromochloromethane recovery was low for these three samples, the corresponding analytical results may also be low. The remaining samples were within acceptable limits.

A laboratory method blank was used to assess whether the laboratory represents a possible source of contamination for the field samples. Methylene chloride was detected in the laboratory blank at a concentration of 0.19 mg/kg. Methylene chloride was detected in every sample analyzed by ATI at concentrations ranging from 0.16 to 1.1 mg/kg. The presence of methylene chloride in the blank suggests that this compound was introduced to the field samples by the laboratory and is not representative of field conditions. No other compounds were detected in the blank.

To assess the precision of the data, laboratory duplicate control samples were evaluated. The duplicate control sample consisted of a blank soil sample spiked with five target parameters. The soil sample was then analyzed twice and the results compared. Relative percent differences (RPDs) of the duplicate target analytes ranged from 1 to 4 percent, indicating excellent reproducibility of the data.

Four samples (91102206 [B-1 at 9.0 feet], 91102209 [B-2 at 13.5 feet], 91102211 [B-2 at 4.5 feet], 91102215 [B-2 at 9.0 feet]) were analyzed for PCE in a separate run from a 1,000,000-fold dilution. Sample 91102204 (B-1 at 5.5 feet) was analyzed for PCE from a 5,000,000-fold dilution. The analytical results from these samples should be considered approximate due to the dilutions that were used.

Harding Lawson Associates

TABLES

Table 1. Soil Sample Analytical Results
VW&R Boise
October 22, 1991

Harding Lawson Associates

Sample Number	Boring/Depth (feet)	Detected 8010/8020 Analytes ¹						TPH ¹		Moisture (%)	Grain Size Classification ⁵
		PCE	TCE	Methylene-Chloride ²	Carbon Tetrachloride	cis-1,2 DCE	1,1,1 TCA	Gasoline	Diesel		
91102204	B-1, 5.5	26,000	3.1	0.75	<0.05	1.3	<0.05	<5	<5	15	CH
91102205	B-1, 8.0	3,090	<5	<5	<5	<5	<5	NA ⁴	NA	NA	NA
91102206	B-1, 9.5	3,100	0.4	0.73	0.18	<0.05	<0.05	<5	<5	4.1	SP-SC
91102209 ³	B-1, 13.5	1,100	<0.05	0.76	<0.05	<0.05	<0.05	<5	<5	11	GW
91102211 ³	B-2, 4.5	3,300	1.5	0.83	<0.05	0.52	<0.05	<5	<5	18	CH
91102215 ³	B-2, 9	840	0.51	0.65	<0.05	<0.05	<0.05	<5	<5	4.7	CH (at 6.5 feet)
91102216	B-2, 8.5	3,100	<5	<5	<5	<5	<5	NA	NA	NA	NA
91102218	B-2, 12.5	4.0	<0.01	0.20	<0.01	0.014	<0.01	<5	<5	11	SC
91102220	B-3, 4	0.23	<0.01	0.22	<0.01	<0.01	<0.01	<5	<5	7.5	SP-SC
91102222	B-3, 8	0.68	<0.01	0.32	<0.01	<0.01	0.016	<5	<5	11	SC
91102224	B-3, 12	0.014	<0.01	0.16	<0.01	<0.01	<0.01	<5	<5	3.5	SP
91102229	B-4, 5.5	0.05	<0.01	0.23	<0.01	<0.01	<0.01	<5	<5	15	CH
9102231	B-4, 10	0.86	<0.05	1.1	<0.05	<0.05	<0.05	<5	<5	5.3	GP-GC
9102233	B-4, 14	0.21	<0.01	0.15	<0.01	<0.01	<0.01	<5	<5	13	SC

1. Concentrations expressed in milligrams per kilogram (mg/kg).

2. Analyte was found in the associated blank as well as the samples.

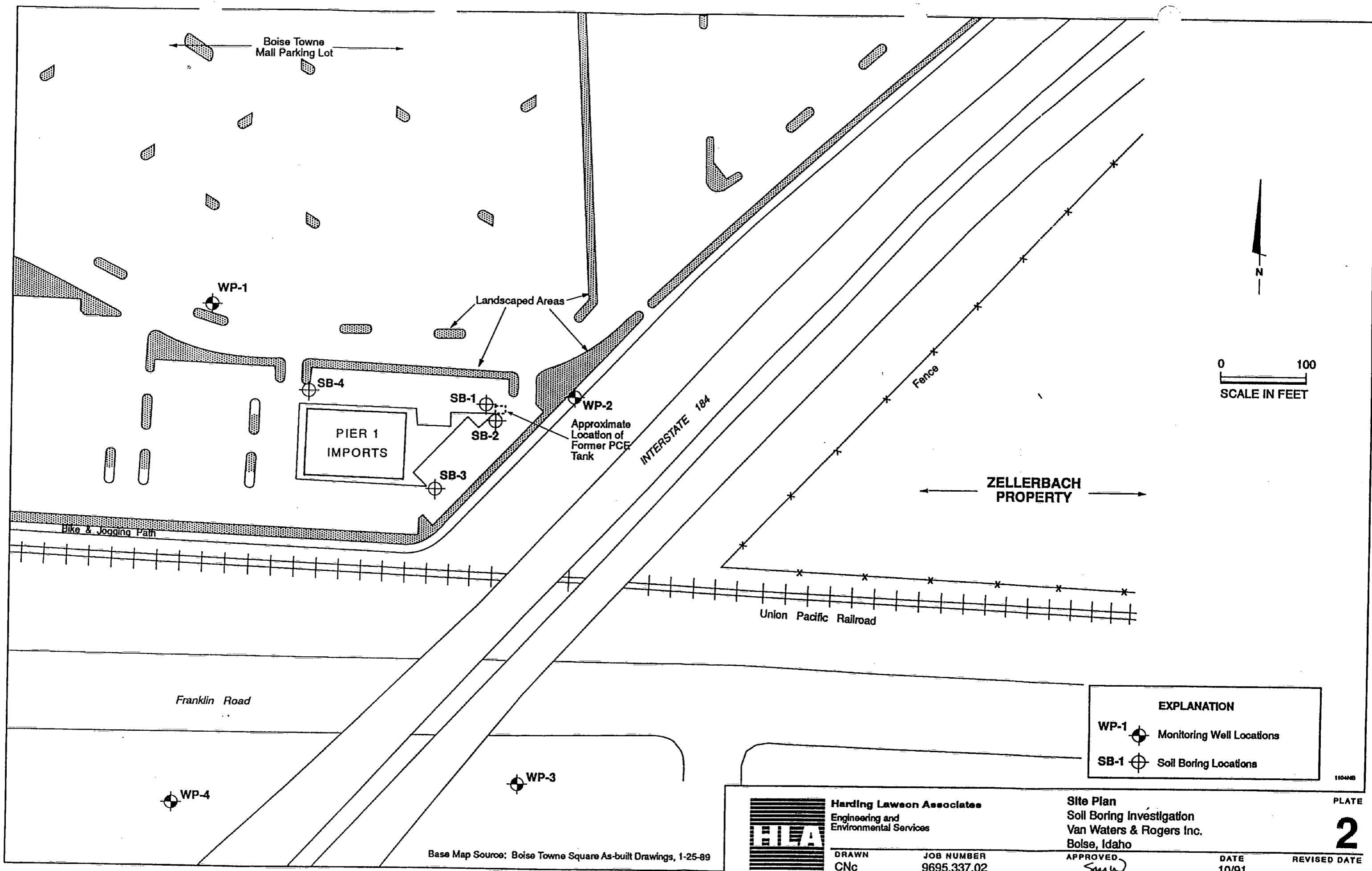
3. Surrogate percent recovery for bromochloromethane is out of acceptable limits.

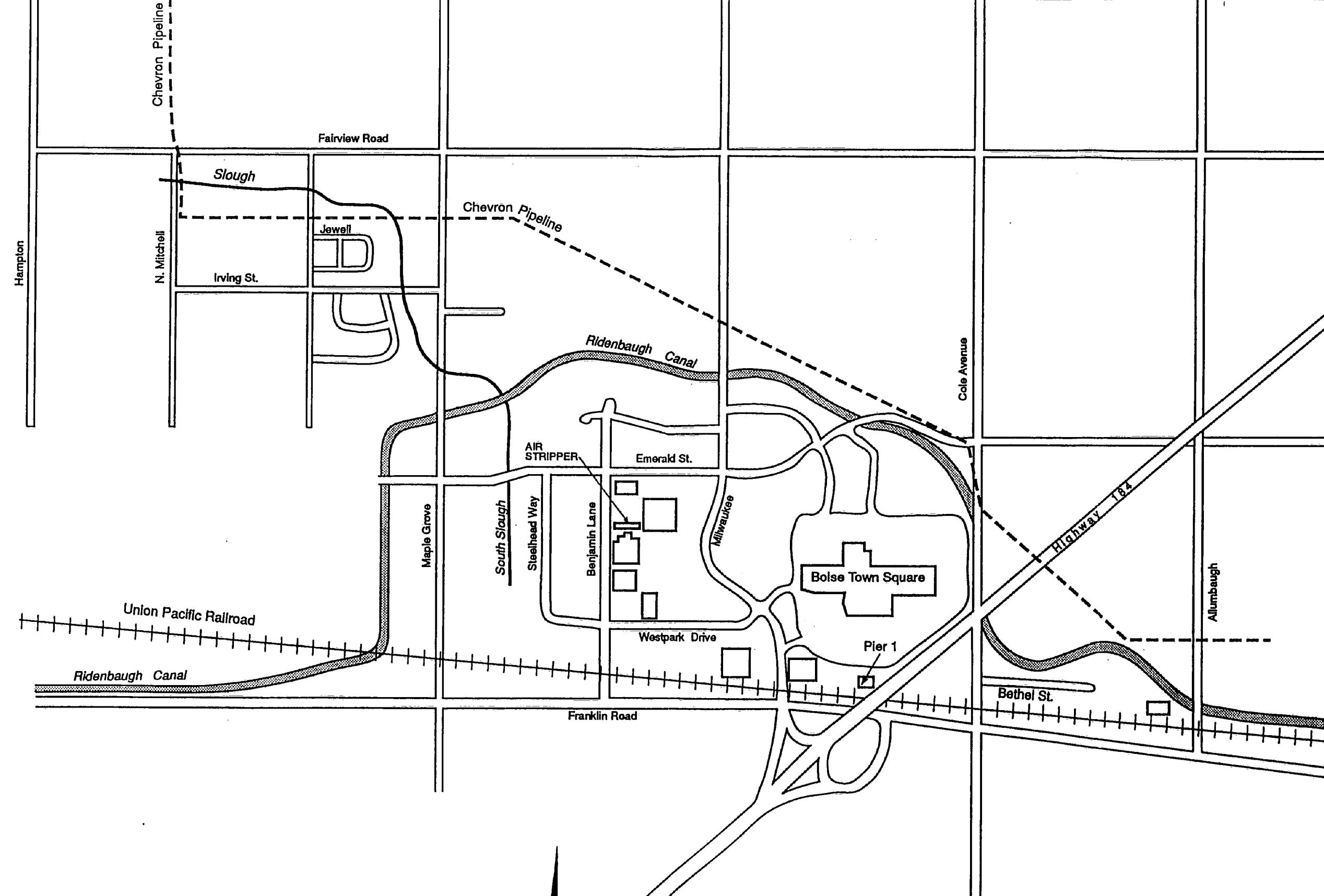
4. NA: Not Analyzed

5. Refer to key to Unified Soil Classification System for explanation (Appendix A).

Harding Lawson Associates

ILLUSTRATIONS





0 1000 2000
Approximate Scale in Feet

N



Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
JGc
JOB NUMBER
9695,337.02

Area Map
Soil Boring Investigation
Van Waters & Rogers Inc.
Boise, Idaho

APPROVED
SMM

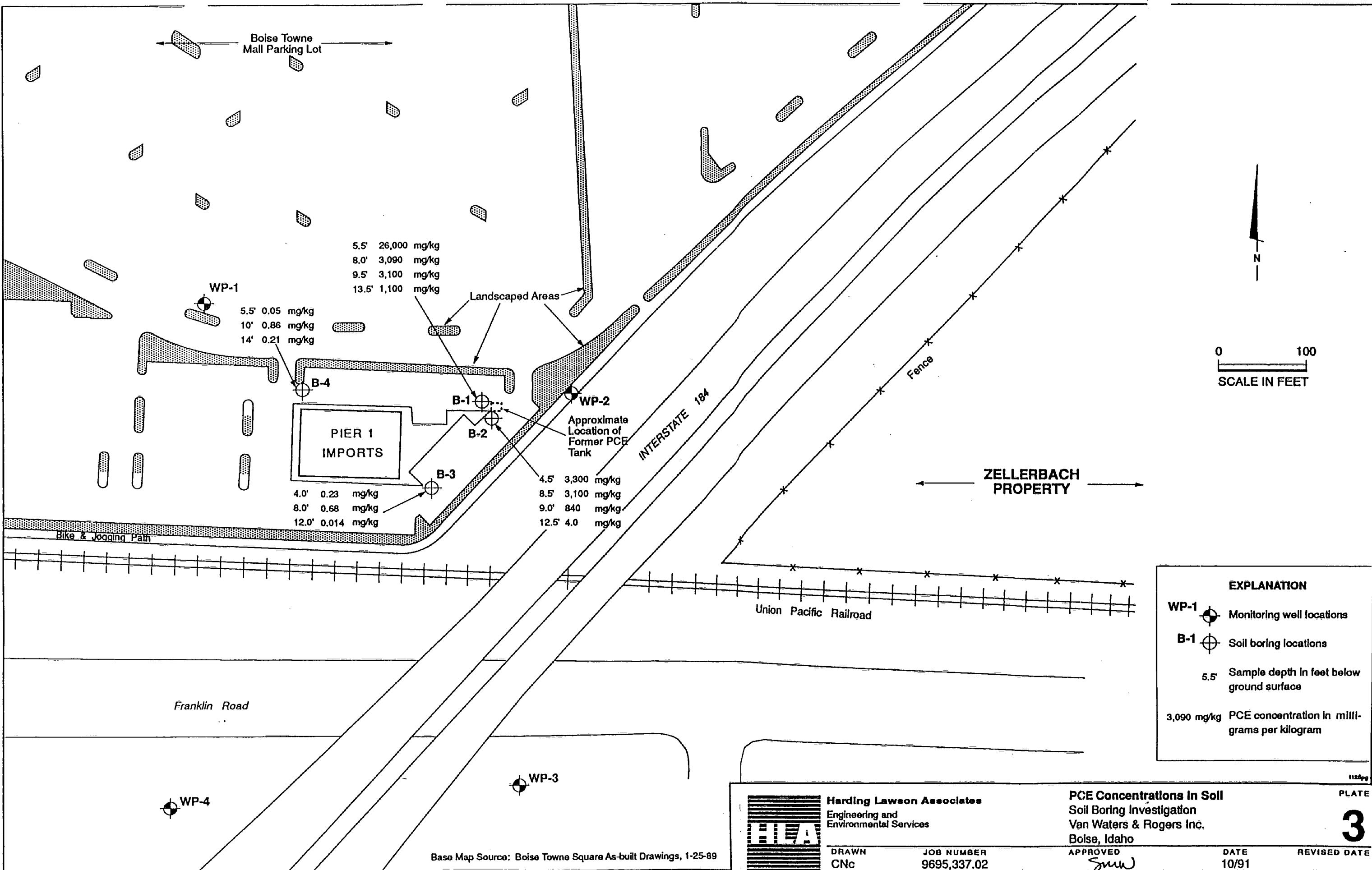
DATE
10/91

REVISED DATE

1104LZ

PLATE

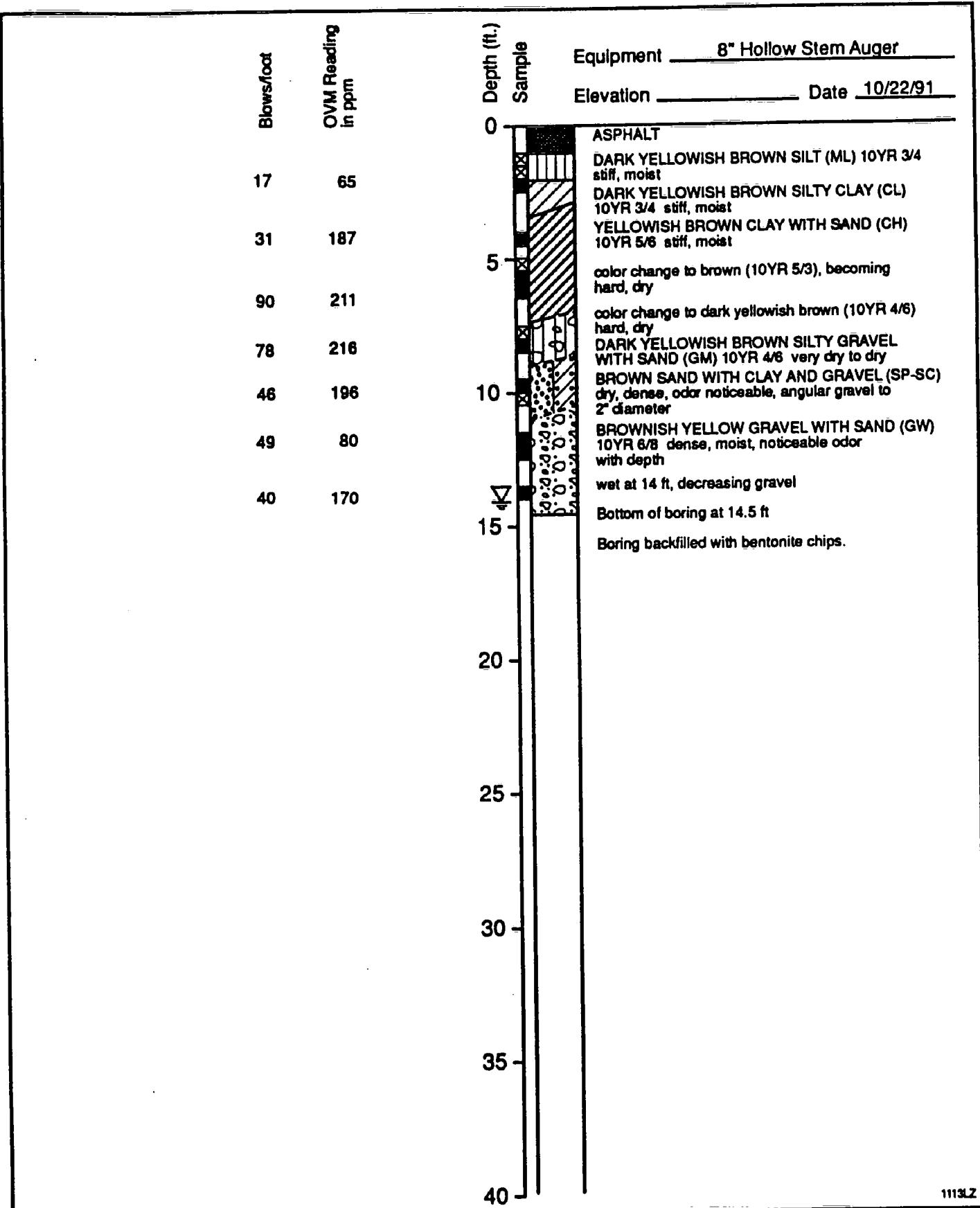
1



Harding Lawson Associates

Appendix A

**BORING LOGS AND KEY TO
THE UNIFIED SOIL CLASSIFICATION SYSTEM**



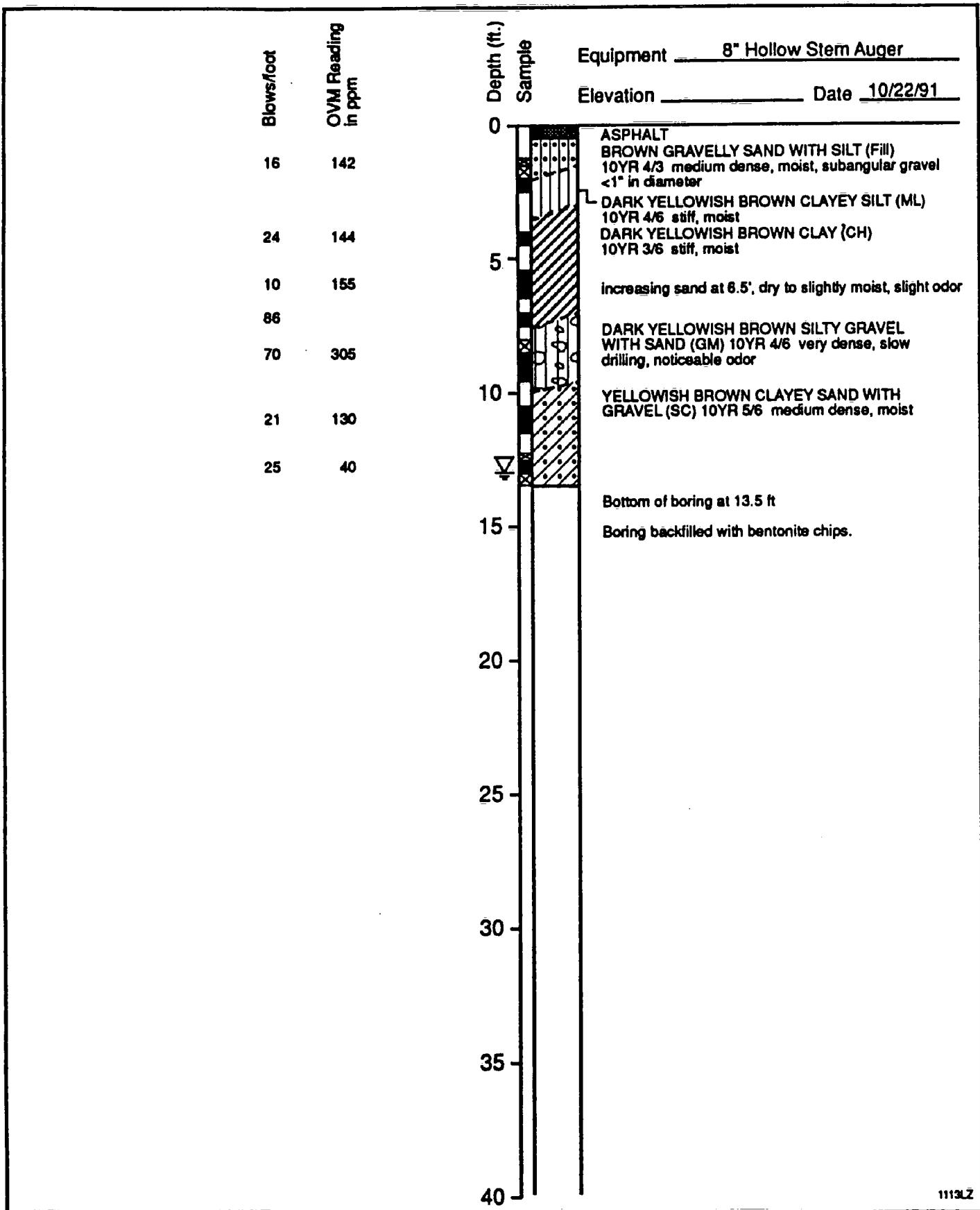
Harding Lawson Associates
Engineering and
Environmental Services

Log of Boring B-1
Work Plan
Pilot Soil Vapor Extraction System
Boise, Idaho

PLATE

A-1

DRAWN CSNC	JOB NUMBER 90-5,337.02	APPROVED SJM	DATE 10/91	REVISED DATE
---------------	---------------------------	-----------------	---------------	--------------



Harding Lawson Associates
Engineering and
Environmental Services

DRAWN
CSNC

JOB NUMBER
9695,337.02

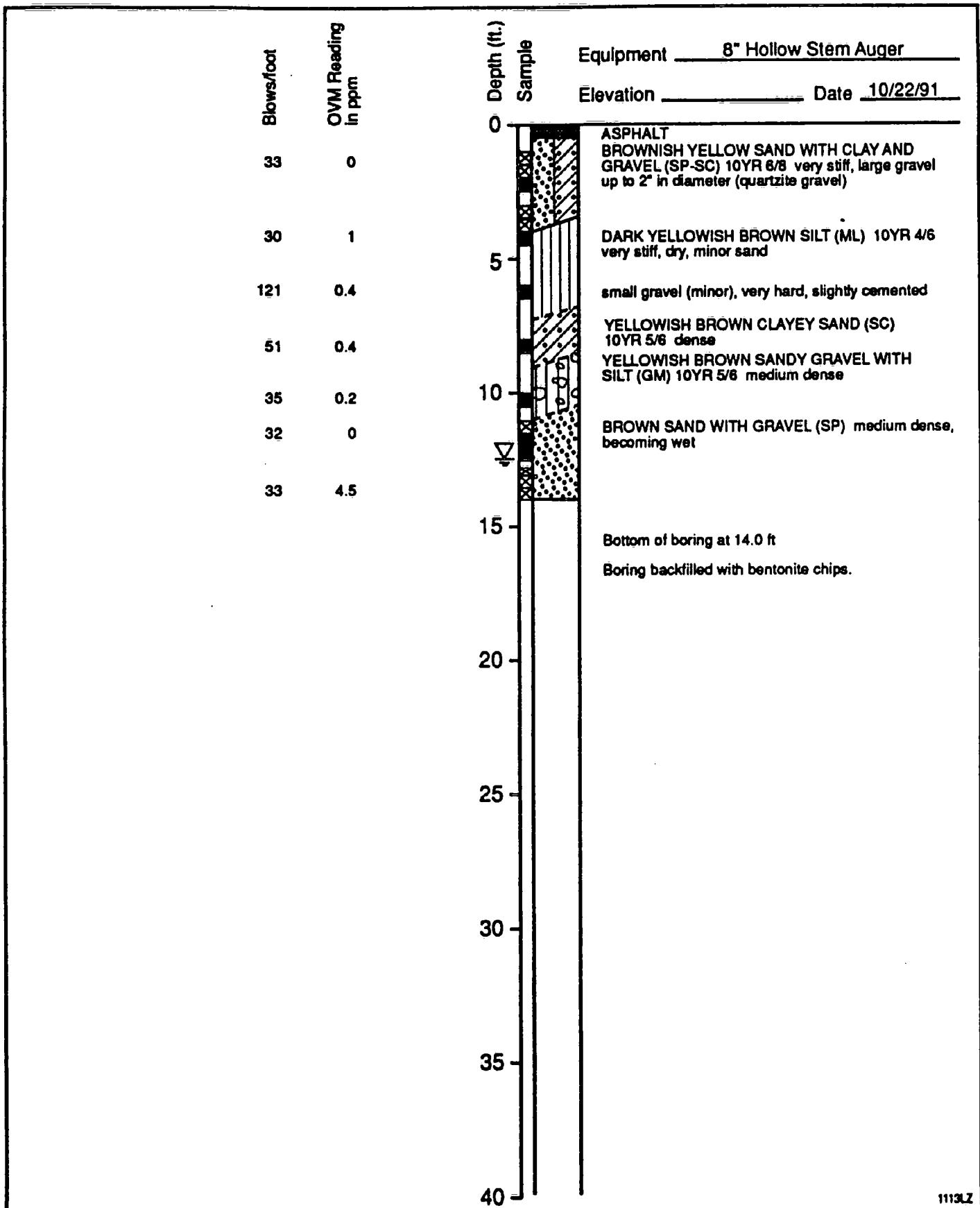
Log of Boring B-2
Work Plan
Pilot Soil Vapor Extraction System
Boise, Idaho

APPROVED
smw

DATE
10/91

A-2

PLATE



Heraing Lawson Associates
Engineering and
Environmental Services

DRAWN
CSNC

JOB NUMBER
S 5,337.02

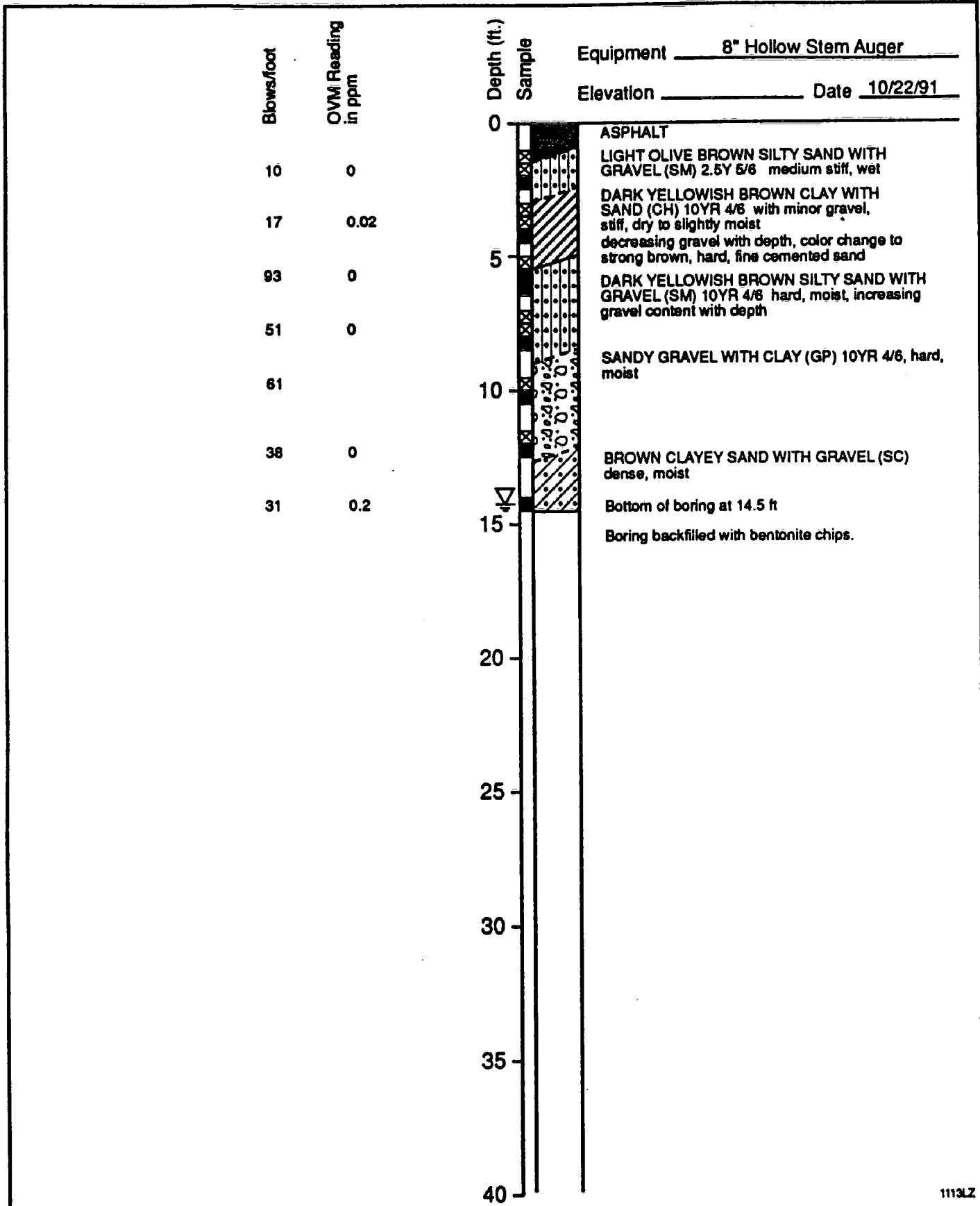
Log of Boring B-3
Work Plan
Pilot Soil Vapor Extraction System
Boise, Idaho

APPROVED
Smeu

DATE
10/91

A-3

PLATE



Harding Lawson Associates
Engineering and
Environmental Services



Log of Boring B-4
Work Plan
Pilot Soil Vapor Extraction System
Boise, Idaho

PLATE

A-4

DRAWN CSNC	JOB NUMBER 1337.02	APPROVED <i>Smith</i>	DATE 10/91	REVISED DATE
---------------	-----------------------	--------------------------	---------------	--------------

MAJOR DIVISIONS			TYPICAL NAMES		
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER MORE THAN No. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES	
		GRAVELS WITH OVER 12% FINES	GP	Poorly graded gravels with or without sand, little or no fines	
			GM	SILTY GRAVELS, SILTY GRAVELS WITH SAND	
			GC	CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND	
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES	
		SANDS WITH OVER 12% FINES	SP	Poorly graded sands with or without gravel, little or no fines	
			SM	SILTY SANDS WITH OR WITHOUT GRAVEL	
			SC	CLAYEY SANDS WITH OR WITHOUT GRAVEL	
			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS	
FINE-GRAINED SOILS MORE THAN HALF IS FINER MORE THAN No. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
				OL	ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
	HIGHLY ORGANIC SOILS			PI	PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION - ASTM D2487-85

Perm - Permeability Consol - Consolidation LL - Liquid Limit (%) PI - Plasticity Index (%) G_s - Specific Gravity MA - Particle Size Analysis <input checked="" type="checkbox"/> - "Undisturbed" Sample <input checked="" type="checkbox"/> - Bulk or Classification Sample	TxUU 3200 (2600) - Unconsolidated Undrained Triaxial Shear (FM) or (S) - (field moisture or saturated)		TxCU 3200 (2600) - Consolidated Undrained Triaxial Shear (P) - (with or without pore pressure measurement)		TxCD 3200 (2600) - Consolidated Drained Triaxial Shear SSCU 3200 (2600) - Simple Shear Consolidated Undrained (P) - (with or without pore pressure measurement)	
	SSCD 3200 (2600) - Simple Shear Consolidated Drained		DSCD 2700 (2000) - Consolidated Drained Direct Shear		UC 470 - Unconfined Compression	
	LVS 700 - Laboratory Vane Shear					
					Shear Strength (psf) Confining Pressure	
					TxUU 3200 (2600) - Unconsolidated Undrained Triaxial Shear (FM) or (S) - (field moisture or saturated) TxCU 3200 (2600) - Consolidated Undrained Triaxial Shear (P) - (with or without pore pressure measurement) TxCD 3200 (2600) - Consolidated Drained Triaxial Shear SSCU 3200 (2600) - Simple Shear Consolidated Undrained (P) - (with or without pore pressure measurement) SSDC 3200 (2600) - Simple Shear Consolidated Drained DSCD 2700 (2000) - Consolidated Drained Direct Shear UC 470 - Unconfined Compression LVS 700 - Laboratory Vane Shear	



Harding Lawson Associates
Engineering and
Environmental Services

Unified Soil Classification and
Key to Test Data
Work Plan
Pilot Soil Vapor Extraction System
Boise, Idaho

PLATE

A-5

DRAWN
CSNc

JOB NUMBER
9605,337.02

APPROVED
Smith

DATE
10/91

REVISED DATE

Harding Lawson Associates

Appendix B

LABORATORY ANALYTICAL REPORTS

ALCHEM LABORATORY

104 W. 31st Street
Boise, Idaho 83714
(208) 336-1172

HARDING LAWSON ASSOCIATES
P.O. BOX 578
NOVATO, CALIFORNIA 97948
ATTN: MICHELLE WATSON

DATE COLLECTED: 10/22/91
TIME COLLECTED:
DATE RECEIVED: 10/23/91
DATE REPORTED: 10/24/91

JOB NO.: 09695.337.02
PROJECT/SITE: VWR - BOISE

COLLECTED BY: GARY LIEBERMAN
MICHELLE WATSON

SOURCE: 91102205 B1-8' (SOIL)

LAB SAMPLE NUMBER - 17171

LABORATORY REPORT FOR "VOLATILE ORGANIC COMPOUNDS" EPA 8021

<u>COMPOUND</u>	<u>METHOD DETECTION</u>	<u>ANALYTICAL</u>
	<u>LEVEL (mg/kg)</u>	<u>RESULTS</u>

THM'S (TRIHALOMETHANES)

Bromodichloromethane	5	*ND
Chlorodibromomethane	5	ND
Bromoform	5	ND
Chloroform	5	ND

REGULATED VOC's

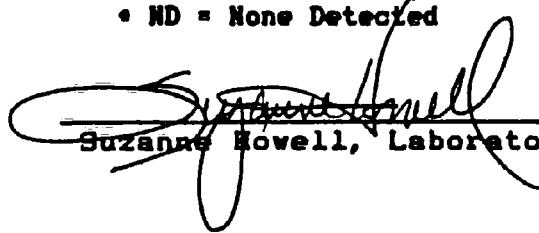
Vinyl Chloride	5	ND
1,1-Dichloroethylene	5	ND
1,1,1-Trichlorethane	5	ND
Carbon Tetrachloride	5	ND
Benzene	5	ND
1,2-Dichloroethane	5	ND
Trichloroethylene	5	ND
p-Dichlorobenzene	5	ND

Date Analyzed: 10/24/91

* ND = None Detected

Analyst: DALE MYERS

REPORT CONT. NEXT PAGE


Suzanne Novell, Laboratory Manager

UNREGULATED VOC's

<u>COMPOUND</u>	<u>METHOD DETECTION LEVEL (mg/kg)</u>	<u>ANALYTICAL RESULTS</u>
Bromobenzene	5	*ND
Bromochloromethane	5	ND
Bromomethane	5	ND
n-Butylbenzene	5	ND
sec-Butylbenzene	5	ND
tert-Butylbenzene	5	ND
Chlorobenzene	5	ND
Chloroethane	5	ND
Chloromethane	5	ND
2-Chlorotoluene	5	ND
4-Chlorotoluene	5	ND
1,2-Dibromo-3-Chloropropane	5	ND
1,2-Dibromoethane	5	ND
Dibromomethane	5	ND
1,3-Dichlorobenzene	5	ND
1,2-Dichlorobenzene	5	ND
Dichlorodifluoromethane	5	ND
1,1-Dichloroethane	5	ND
cis-1,2-Dichloroethene	5	ND
trans-1,2-Dichloroethene	5	ND
1,2-Dichloropropane	5	ND
1,3-Dichloropropane	5	ND
2,2-Dichloropropane	5	ND
1,1-Dichloropropene	5	ND
Ethyl Benzene	5	ND
Hexachlorobutadiene	5	ND
Isopropylbenzene	5	ND
p-Isopropyltoluene	5	ND
Methylene Chloride	5	ND
Naphthalene	5	ND
n-Propylbenzene	5	ND
Styrene	5	ND
1,1,1,2-Tetrachloroethane	5	ND
1,1,2,2-Tetrachloroethane	5	ND
Tetrachloroethene	5	3090 mg/kg
Toluene	5	ND
1,2,3-Trichlorobenzene	5	ND
1,2,4-Trichlorobenzene	5	ND
1,1,2-Trichloroethane	5	ND
Trichlorofluoromethane	5	ND
1,2,3-Trichloropropane	5	ND
1,2,4-Trimethylbenzene	5	ND
1,3,5-Trimethylbenzene	5	ND
Xylene	5	ND

* ND = None Detected

CLIENT: HARDING LAWSON ASSOCIATES (91102205 B1-8')

ALCHEM LABORATORY

104 W. 31st Street
Boise, Idaho 83714
(208) 336-1172

HARDING LAWSON ASSOCIATES
P.O. BOX 578
NOVATO, CALIFORNIA 97948
ATTN: MICHELLE WATSON

DATE COLLECTED: 10/22/91
TIME COLLECTED:
DATE RECEIVED: 10/23/91
DATE REPORTED: 10/24/91

JOB NO.: 09695.337.02
PROJECT/SITE: VWR - BOISE

COLLECTED BY: GARY LIEBERMAN
MICHELLE WATSON

SOURCE: 91102216 B2-8.5' (SOIL)

LAB SAMPLE NUMBER - 17172

LABORATORY REPORT FOR "VOLATILE ORGANIC COMPOUNDS" EPA 8021

<u>COMPOUND</u>	<u>METHOD DETECTION</u>	<u>ANALYTICAL LEVEL (mg/kg)</u>	<u>RESULTS</u>
-----------------	-------------------------	---------------------------------	----------------

THM'S (TRIHALOMETHANES)

Bromodichloromethane	5	ND
Chlorodibromomethane	5	ND
Bromoform	5	ND
Chloroform	5	ND

REGULATED VOC's

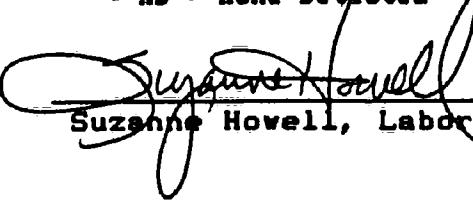
Vinyl Chloride	5	ND
1,1-Dichloroethylene	5	ND
1,1,1-Trichloroethane	5	ND
Carbon Tetrachloride	5	ND
Benzene	5	ND
1,2-Dichloroethane	5	ND
Trichloroethylene	5	ND
p-Dichlorobenzene	5	ND

Date Analyzed: 10/24/91

* ND = None Detected

Analyst: DALE MYERS

REPORT CONT. NEXT PAGE


Suzanne Howell, Laboratory Manager

UNREGULATED VOC's

<u>COMPOUND</u>	<u>METHOD DETECTION LEVEL (mg/kg)</u>	<u>ANALYTICAL RESULTS</u>
Bromobenzene	5	*ND
Bromochloromethane	5	ND
Bromomethane	5	ND
n-Butylbenzene	5	ND
sec-Butylbenzene	5	ND
tert-Butylbenzene	5	ND
Chlorobenzene	5	ND
Chloroethane	5	ND
Chloromethane	5	ND
2-Chlorotoluene	5	ND
4-Chlorotoluene	5	ND
1,2-Dibromo-3-Chloropropene	5	ND
1,2-Dibromoethane	5	ND
Dibromomethane	5	ND
1,3-Dichlorobenzene	5	ND
1,2-Dichlorobenzene	5	ND
Dichlorodifluoromethane	5	ND
1,1-Dichloroethane	5	ND
cis-1,2-Dichloroethene	5	ND
trans-1,2-Dichloroethene	5	ND
1,2-Dichloropropene	5	ND
1,3-Dichloropropene	5	ND
2,2-Dichloropropene	5	ND
1,1-Dichloropropene	5	ND
Ethyl Benzene	5	ND
Hexachlorobutadiene	5	ND
Isopropylbenzene	5	ND
p-Isopropyltoluene	5	ND
Methylene Chloride	5	ND
Naphthalene	5	ND
n-Propylbenzene	5	ND
Styrene	5	ND
1,1,1,2-Tetrachloroethane	5	ND
1,1,2,2-Tetrachloroethane	5	ND
Tetrachloroethene	5	3100 mg/kg
Toluene	5	ND
1,2,3-Trichlorobenzene	5	ND
1,2,4-Trichlorobenzene	5	ND
1,1,2-Trichloroethane	5	ND
Trichlorofluoromethane	5	ND
1,2,3-Trichloropropene	5	ND
1,2,4-Trimethylbenzene	5	ND
1,3,5-Trimethylbenzene	5	ND
Xylene	5	ND

* ND = None Detected

CLIENT: HARDING LAWSON ASSOCIATES (91102216 B2-8.5')



rding son state
200 Rush Landing Road
P.O. Box 6107
Novato, California 94948
415-892-0821
Telexcopy: 415/892-1586

CHAIN or CLOTH FORM

Lab: A1cren

Job Number: 09695.337.07

Name/Location: VWR Borel

Project Manager: Melissa

Samplers: M Watson
G Lieberman

Recorder: S Watson
(Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER	DATE						
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃		Yr	Wk	Seq	Yr	Mo	Dy	Time
50	X				1			91102205	91	1022					
50	X				1			91102216	91	1022					

**STATION DESCRIPTION/
NOTES**

ANALYSIS REQUESTED

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)

RECOGNISED BY: *Signature*
S Michael Watson

RECEIVED BY: (Signature)

DATE/TIME

REINQUISITION BY: (Signature)

RECEIVED BY: (Signature)

DATE/TIME

RELINQUISHED BY: (Signature)

RECEIVED BY: (Signature)

DATE/TIME

RELINQUISHED BY: *(Signature)*

RECEIVED BY: (Signature)

DATE/TIME

DISPATCHED BY: *(Signature)*

DATE/TIME

RECEIVED IN POLICE BY: DATE/TIME
(Signature) *Sgt. D. Myers* 10/23/01 10:05

METHOD OF SHIPMENT

ALCHEM LABORATORY

104 W. 31st Street
Boise, Idaho 83714
(208) 336-1172

HARDING LAWSON ASSOCIATES
P. O. BOX 578
NOVATO, CALIFORNIA 97948
ATTN: MICHELLE WATSON

DATE COLLECTED: 10/22/91
TIME COLLECTED: 1550
DATE RECEIVED: 10/22/91
DATE REPORTED: 10/23/91

JOB NO.: 09695.337.02
PROJECT/SITE: VWR - BOISE

COLLECTED BY: GARY LIEBERMAN
MICHELLE WATSON

SOURCE: 911022W1 (WATER)

LAB SAMPLE NUMBER - 17169

LABORATORY REPORT FOR "VOLATILE ORGANIC COMPOUNDS" EPA 8021

<u>COMPOUND</u>	<u>METHOD DETECTION LEVEL (ug/l)</u>	<u>ANALYTICAL RESULTS</u>	<u>MAX. CONTAMINANT LEVEL (ug/l)</u>
<u>THM'S (TRIHALOMETHANES)</u>			
Bromodichloromethane	0.2	*ND	
Chlorodibromomethane	0.5	ND	
Bromoform	1.0	ND	
Chloroform	0.2	ND	
<u>Total THM's</u>	<u>1.0</u>	<u>ND</u>	100

REGULATED VOC's

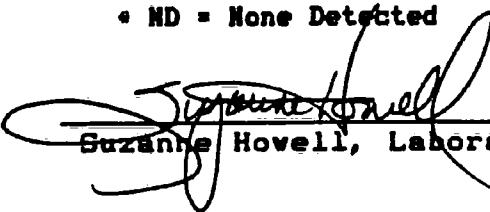
Vinyl Chloride	0.2	ND	2.0
1,1-Dichloroethylene	0.5	ND	7.0
1,1,1-Trichlorethane	0.5	ND	200.0
Carbon Tetrachloride	0.5	ND	5.0
Benzene	0.5	ND	5.0
1,2-Dichloroethane	0.5	ND	5.0
Trichloroethylene	0.5	ND	5.0
p-Dichlorobenzene	0.5	ND	75.0

Date Analyzed: 10/23/91

* ND = None Detected

Analyst: DALE MYERS

REPORT CONT. NEXT PAGE


Suzanne Hovell, Laboratory Manager

REPORT CONTINUED

"Lab No. 17169"

PAGE 2

UNREGULATED VOC's

<u>COMPOUND</u>	<u>METHOD DETECTION LEVEL (ug/l)</u>	<u>ANALYTICAL RESULTS (ug/l)</u>
Bromobenzene	0.5	*ND
Bromochloromethane	0.5	ND
Bromomethane	2.0	ND
n-Butylbenzene	0.5	ND
sec-Butylbenzene	0.5	ND
tert-Butylbenzene	0.5	ND
Chlorobenzene	0.5	ND
Chloroethane	1.0	ND
Chloromethane	0.5	ND
2-Chlorotoluene	0.5	ND
4-Chlorotoluene	0.5	ND
1,2-Dibromo-3-Chloropropane	5.0	ND
1,2-Dibromoethane	1.5	ND
Dibromomethane	4.0	ND
1,3-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND
Dichlorodifluoromethane	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,2-Dichloropropane	0.5	ND
1,3-Dichloropropane	0.5	ND
2,2-Dichloropropane	0.5	ND
1,1-Dichloropropene	0.5	ND
Ethyl Benzene	0.5	ND
Hexachlorobutadiene	0.5	ND
Isopropylbenzene	0.5	ND
p-Isopropyltoluene	0.5	ND
Methylene Chloride	0.5	ND
Naphthalene	0.5	ND
n-Propylbenzene	0.5	ND
Styrene	0.5	ND
1,1,1,2-Tetrachloroethane	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
Tetrachloroethene	0.5	1610.0
Toluene	0.5	ND
1,2,3-Trichlorobenzene	0.5	ND
1,2,4-Trichlorobenzene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Trichlorofluoromethane	0.5	ND
1,2,3-Trichloropropane	0.5	ND
1,2,4-Trimethylbenzene	0.5	ND
1,3,5-Trimethylbenzene	0.5	ND
Xylene	0.5	ND

* ND = None Detected

CLIENT: HARDING LAWSON ASSOCIATES (911022W1)

ALCHEM LABORATORY

104 W. 31st Street
Boise, Idaho 83714
(208) 336-1172

HARDING LAWSON ASSOCIATES
P.O. BOX 578
NOVATO, CALIFORNIA 97948
ATTN: MICHELLE WATSON

DATE COLLECTED: 10/22/91
TIME COLLECTED: 1555
DATE RECEIVED: 10/22/91
DATE REPORTED: 10/23/91

JOB NO.: 09695.337.02
PROJECT/SITE: VWR - BOISE

COLLECTED BY: GARY LIEBERMAN
MICHELLE WATSON

SOURCE: 911022W2 (WATER)

LAB SAMPLE NUMBER - 17170

LABORATORY REPORT FOR "VOLATILE ORGANIC COMPOUNDS" EPA 8021

<u>COMPOUND</u>	<u>METHOD DETECTION LEVEL (ug/l)</u>	<u>ANALYTICAL RESULTS</u>	<u>MAX. CONTAMINANT LEVEL (ug/l)</u>
-----------------	--------------------------------------	---------------------------	--------------------------------------

THM'S (TRIHALOMETHANES)

Bromodichloromethane	0.2	ND	
Chlorodibromomethane	0.5	ND	
Bromoform	1.0	ND	
Chloroform	0.2	ND	
<u>Total THM's</u>	<u>1.0</u>	<u>ND</u>	100

REGULATED VOC's

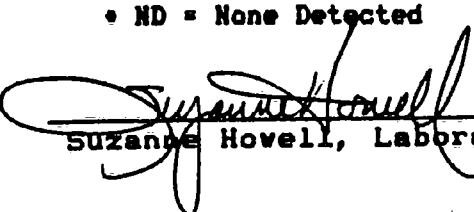
Vinyl Chloride	0.2	ND	2.0
1,1-Dichloroethylene	0.5	ND	7.0
1,1,1-Trichlorethane	0.5	ND	200.0
Carbon Tetrachloride	0.5	ND	5.0
Benzene	0.5	ND	5.0
1,2-Dichloroethane	0.5	ND	5.0
Trichloroethylene	0.5	0.9	5.0
p-Dichlorobenzene	0.5	ND	75.0

Date Analyzed: 10/23/91

* ND = None Detected

Analyst: DALE MYERS

REPORT CONT. NEXT PAGE


Suzanne Hovell, Laboratory Manager

REPORT CONTINUED

"Lab No. 17170"

PAGE 2

UNREGULATED VOC's

<u>COMPOUND</u>	<u>METHOD DETECTION LEVEL (ug/l)</u>	<u>ANALYTICAL RESULTS (ug/l)</u>
Bromobenzene	0.5	*ND
Bromochloromethane	0.5	ND
Bromomethane	2.0	ND
n-Butylbenzene	0.5	ND
sec-Butylbenzene	0.5	ND
tert-Butylbenzene	0.5	ND
Chlorobenzene	0.5	ND
Chloroethane	1.0	ND
Chloromethane	0.5	ND
2-Chlorotoluene	0.5	ND
4-Chlorotoluene	0.5	ND
1,2-Dibromo-3-Chloropropane	5.0	ND
1,2-Dibromoethane	1.5	ND
Dibromomethane	4.0	ND
1,3-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND
Dichlorodifluoromethane	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,2-Dichloropropane	0.5	ND
1,3-Dichloropropane	0.5	ND
2,2-Dichloropropane	0.5	ND
1,1-Dichloropropene	0.5	ND
Ethyl Benzene	0.5	ND
Hexachlorobutadiene	0.5	ND
Isopropylbenzene	0.5	ND
p-Isopropyltoluene	0.5	ND
Methylene Chloride	0.5	ND
Naphthalene	0.5	ND
n-Propylbenzene	0.5	ND
Styrene	0.5	ND
1,1,1,2-Tetrachloroethane	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
Tetrachloroethene	0.5	2330.0
Toluene	0.5	4.8
1,2,3-Trichlorobenzene	0.5	ND
1,2,4-Trichlorobenzene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Trichlorofluoromethane	0.5	ND
1,2,3-Trichloropropane	0.5	ND
1,2,4-Trimethylbenzene	0.5	ND
1,3,5-Trimethylbenzene	0.5	ND
Xylene	0.5	0.9

* ND = None Detected

CLIENT: HARDING LAWSON ASSOCIATES (911022W2)



Engineering Services Associates
7655 Redwood Boulevard
P.O. Box 578
Novato, California 94948
415/892-0821
Telescopy: General: 415/892-0833
Accounting: 415/892-1065

CHAIN OF CUSTODY FORM

Lab: Alchem

Job Number: 091695.337.02

Name/Location: W.W. & Beise

Project Manager: Michelle Lipton

Samplers: Gary Lieberman
M. Watson

Recorder: S. Michelle Watson
(Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER	DATE						
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃		Yr	Wk	Seq	Yr	Mo	Dy	Time
6910	X				3			911022W191	1022	1550					
17010	X				3			910022W291	1022	1555					

STATION DESCRIPTION/ NOTES

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						24 Hour T/A
						Contact Michelle
						Watson C
						Owhee Inn
						Romm 128

CHAIN OF CUSTODY RECORD			
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
Dany A. Sael			
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY (Signature)	DATE/TIME
Dany A. Sael	1422 5:10	Sgt. Dany A. Sael	10/29/10 5:10
METHOD OF SHIPMENT			



ATI I.D. # 9110-290-5

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102215
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C7 - C12
 GASOLINE

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C12 - C24
 DIESEL

Please note: These results represent tetrachloroethene subtracted data.

Analytical Technologies, Inc.

ATI I.D. # 9110-290-6

FUEL HYDROCARBONS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102218
SAMPLE MATRIX : SOIL
METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/24/91
DATE ANALYZED : 10/25/91
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C7 - C12
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C12 - C24
DIESEL

ATI I.D. # 9110-290-7

FUEL HYDROCARBONS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102220
SAMPLE MATRIX : SOIL
METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/24/91
DATE ANALYZED : 10/25/91
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C7 - C12
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C12 - C24
DIESEL



ATI I.D. # 9110-290-8

FUEL HYDROCARBONS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102222
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

RESULTS

<5
 C7 - C12
 GASOLINE

<5
 C12 - C24
 DIESEL



ATI I.D. # 9110-290-9

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102224
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C7 - C12
 GASOLINE

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C12 - C24
 DIESEL

ATI I.D. # 9110-290-10
**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102229
SAMPLE MATRIX : SOIL
METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/24/91
DATE ANALYZED : 10/25/91
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUNDS
RESULTS

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C7 - C12
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C12 - C24
DIESEL



ATI I.D. # 9110-290-11

FUEL HYDROCARBONS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102231
SAMPLE MATRIX : SOIL
METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/24/91
DATE ANALYZED : 10/25/91
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUNDS

RESULTS

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C7 - C12
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C12 - C24
DIESEL

Please note: These results represent tetrachloroethene subtracted data.



ATI I.D. # 9110-290-12

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102233
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C7 - C12
 GASOLINE

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C12 - C24
 DIESEL

**FUEL HYDROCARBONS
QUALITY CONTROL DATA**

CLIENT : HARDING LAWSON ASSOCIATES SAMPLE I.D. # : 9110-286-3
 PROJECT # : 09695, 337.02 DATE EXTRACTED : 10/24/91
 PROJECT NAME : VW&R BOISE DATE ANALYZED : 10/25/91
 EPA METHOD : 8015 (MODIFIED) UNITS : mg/Kg
 SAMPLE MATRIX : SOIL

COMPOUNDS	SAMPLE	SPIKE	SPIKED %	SPIKED %	DUP.	DUP.	
	RESULT	ADDED	RESULT		REC.	SAMPLE	REC.
FUEL HYDROCARBONS (DIESEL)	<5.0	500	574	115	581	116	1

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Duplicate Result})|}{\text{Average Result}} \times 100$$



Analytical Technologies, Inc.

ATI I.D. # 9110-290

GENERAL CHEMISTRY ANALYSIS

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695, 337.02
PROJECT NAME : VW&R BOISE

MATRIX : SOIL

PARAMETER DATE PREPARED DATE ANALYZED

MOISTURE - 10/25/91



Analytical Technologies, Inc.

ATI I.D. # 9110-290

GENERAL CHEMISTRY ANALYSIS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE

MATRIX : SOIL
UNITS : %

ATI I.D. # CLIENT I.D. MOISTURE

9110-290-1	91102204	15
9110-290-2	91102206	4.1
9110-290-3	91102209	11
9110-290-4	91102211	18
9110-290-5	91102215	4.7
9110-290-6	91102218	11
9110-290-7	91102220	7.5
9110-290-8	91102222	11
9110-290-9	91102224	3.5
9110-290-10	91102229	15
9110-290-11	91102231	5.3
9110-290-12	91102233	13



Analytical Technologies, Inc.

ATI I.D. # 9110-290

GENERAL CHEMISTRY ANALYSIS
QUALITY CONTROL DATACLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISEMATRIX : SOIL
UNITS :

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED RESULT	SPIKE ADDED	% REC
MOISTURE	9110-290-10	15	16	6	N/A	N/A	N/A
MOISTURE	9110-291-10	26	29	11	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

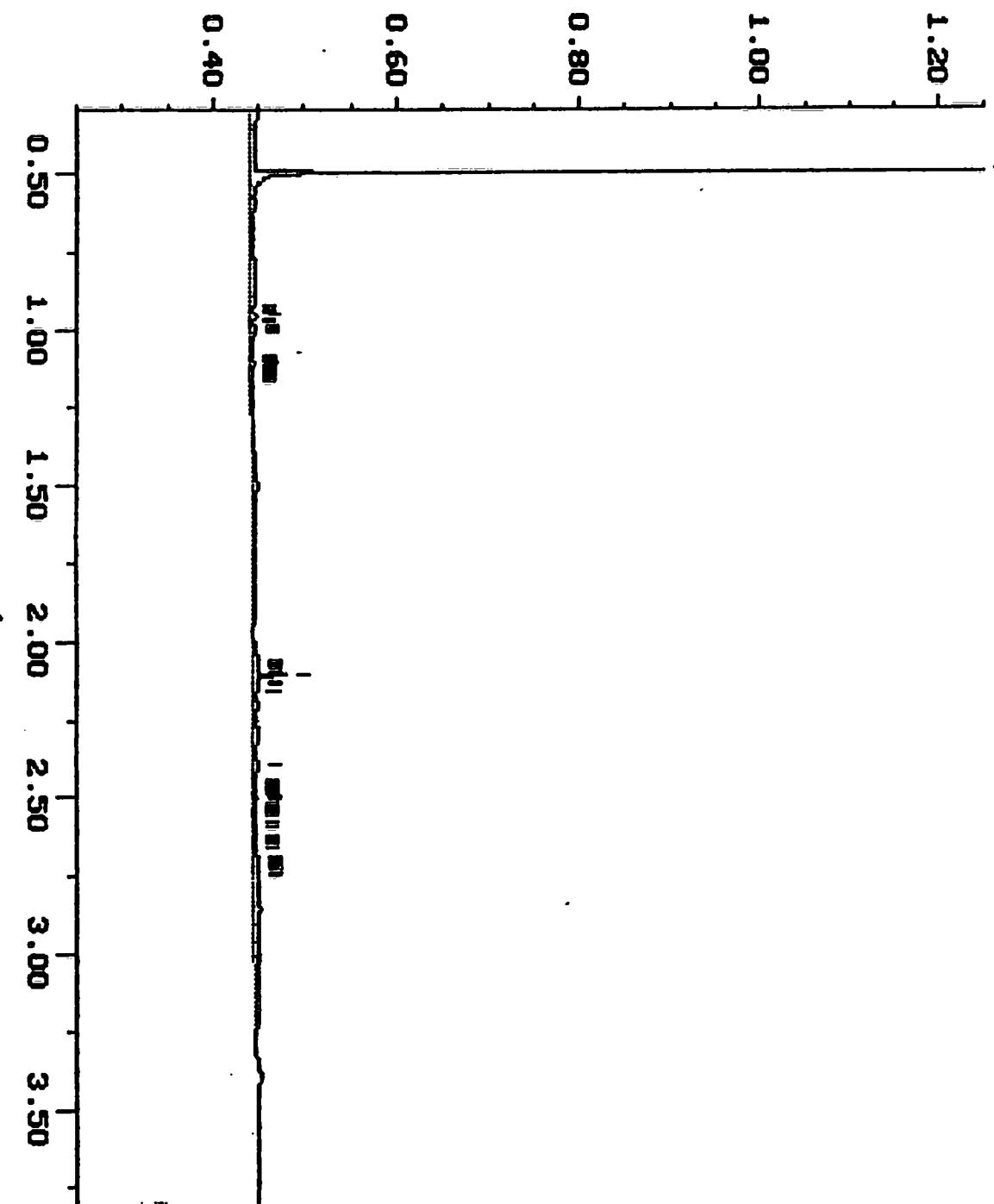
$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Sample: 9110-290-1 DIL
Acquired: 26-OCT-91 1:37
Dilution: 1 : 100,000

Channel: BERT
Method: L:\BRO2\NAIDATA\BERT\FUEL1023
Inj Vol: 1.00

Filename: 1023BE12
Operator: PEA

$\times 10^{-1}$ volts

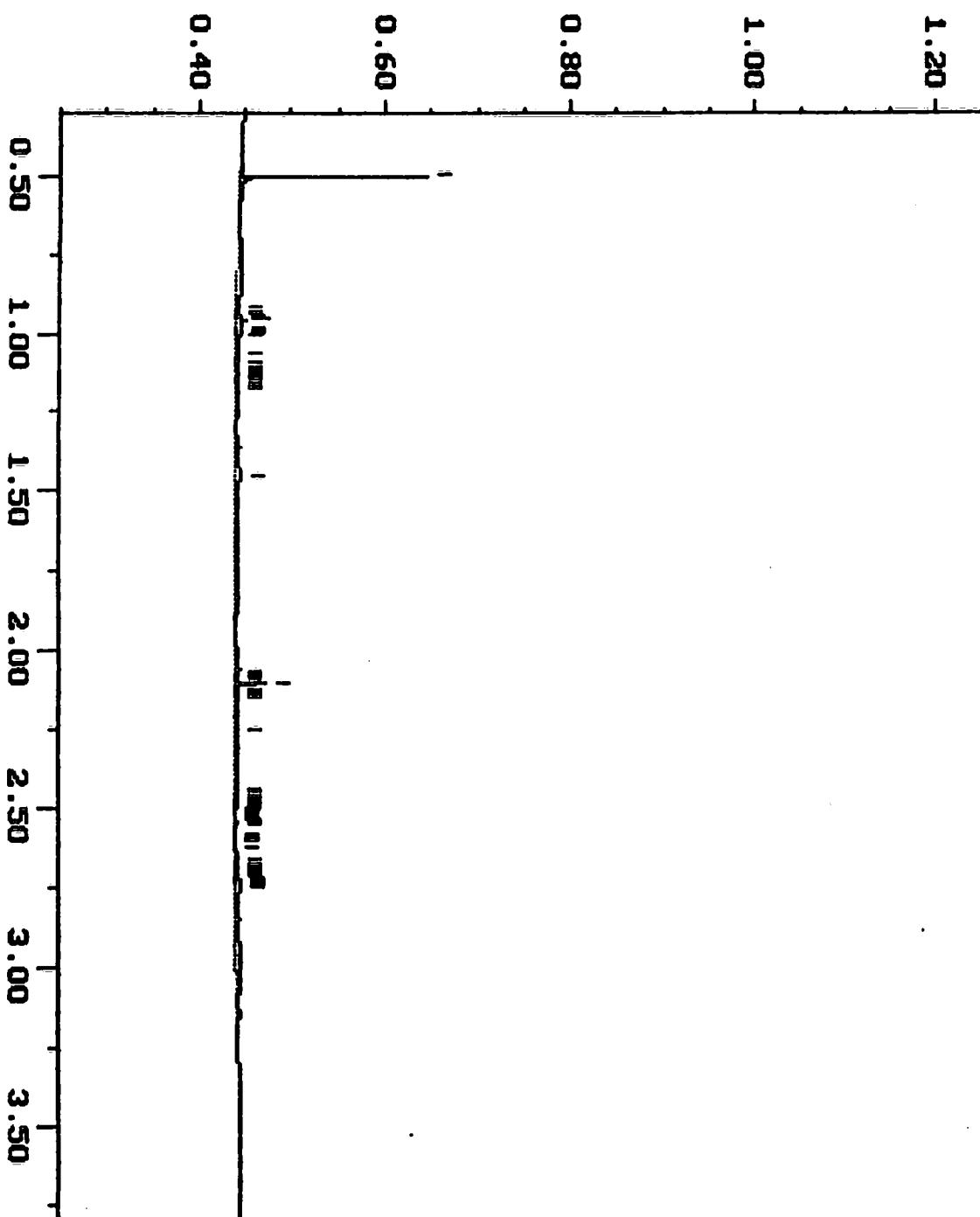


Sample: 9110-290-2 BIL
Acquired: 26-OCT-91 2:23
Dilution: 1 : 100.000

Channel: BERT
Method: L:\BRO2\MAXDATA\BERT\FUEL1025
Inj Vol: 1.00

Filename: 1025BE13
Operator: PEA

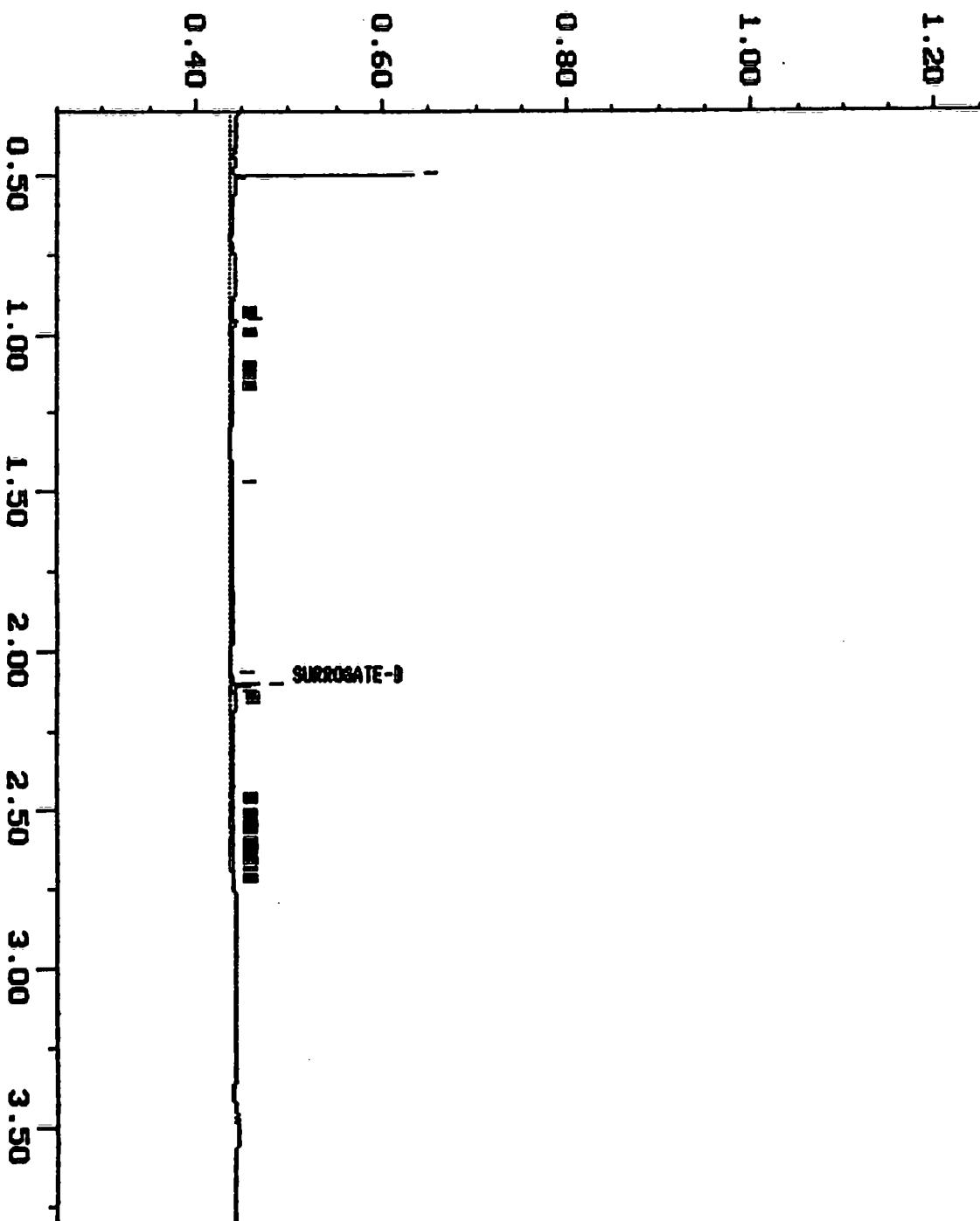
$\times 10^{-1}$ volts



Sampler: 9110-290-3 DIL Channel: BERT
Acquired: 26-OCT-91 3:55 Method: L:\BRO2\MAXDATA\BERT\FUEL1025
Dilution: 1 : 100.000 Inj Vol: 1.00

filename: 10250E15
Operator: PEA

$\times 10^{-1}$ volts

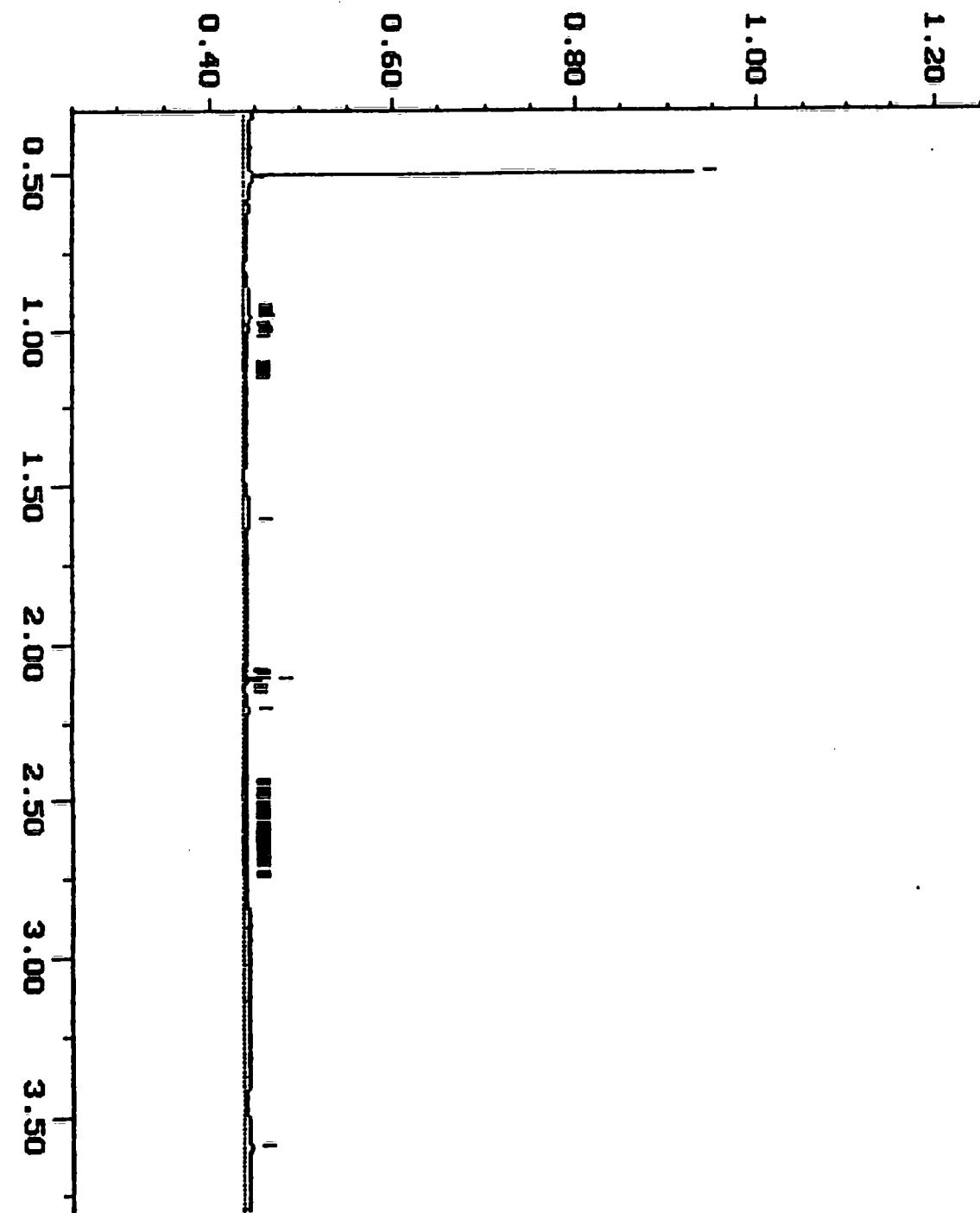


Sample: 9110-290-4 DIL
Acquired: 26-OCT-91 4:42
Dilution: 1 : 100,000

Channel: BERT
Method: L:\BERT\DATA\BERT\FUEL\1025
Inj Vol: 1.00

Filename: 1025B16
Operator: PEA

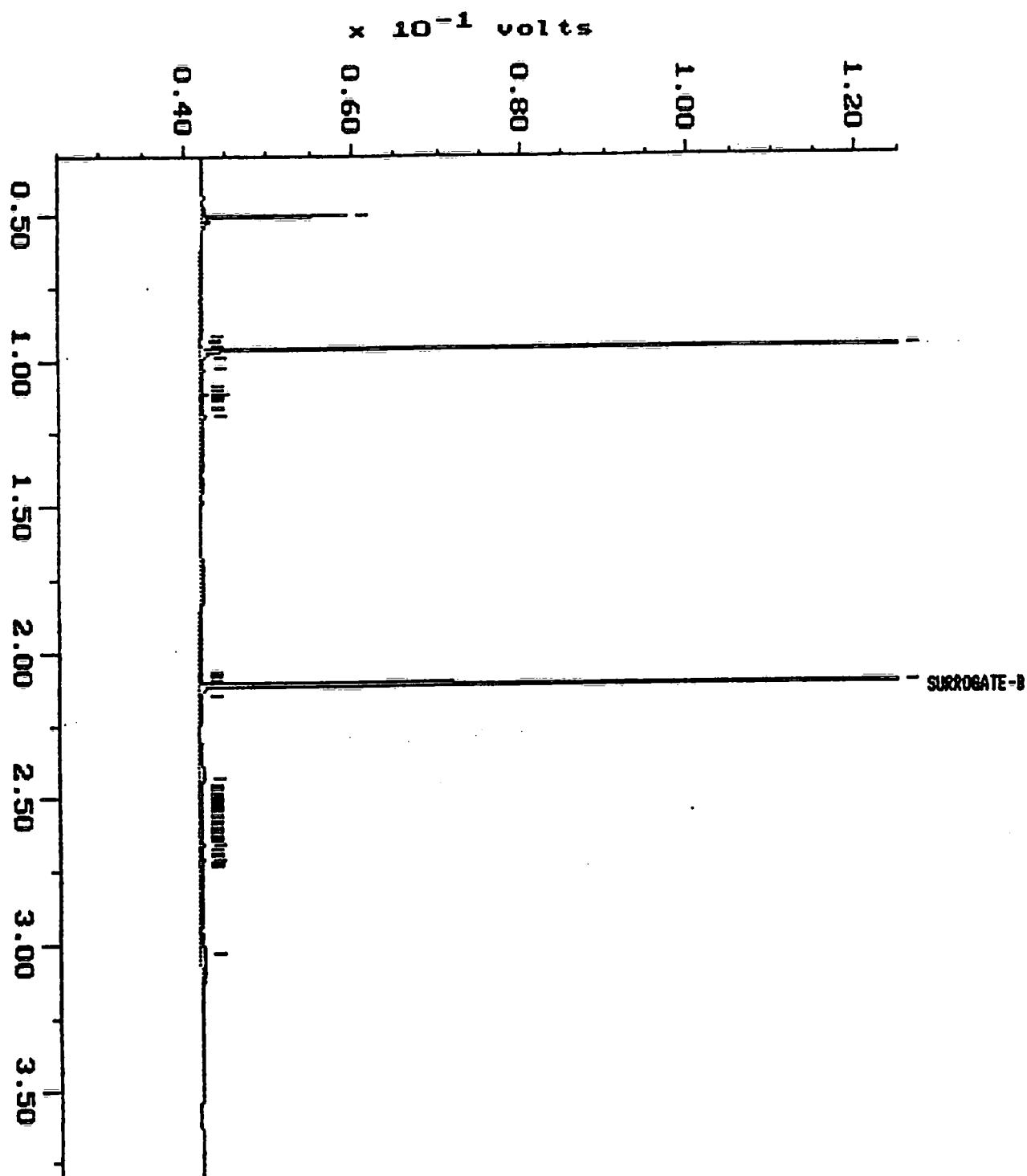
$\times 10^{-1}$ volts



Samples: 9110-290-5
Acquired: 25-OCT-91 08:56
Inj Vol: 1.00

Channel: BERT
Method: L:\BRO2\MAXDATA\BERT\FUEL1024

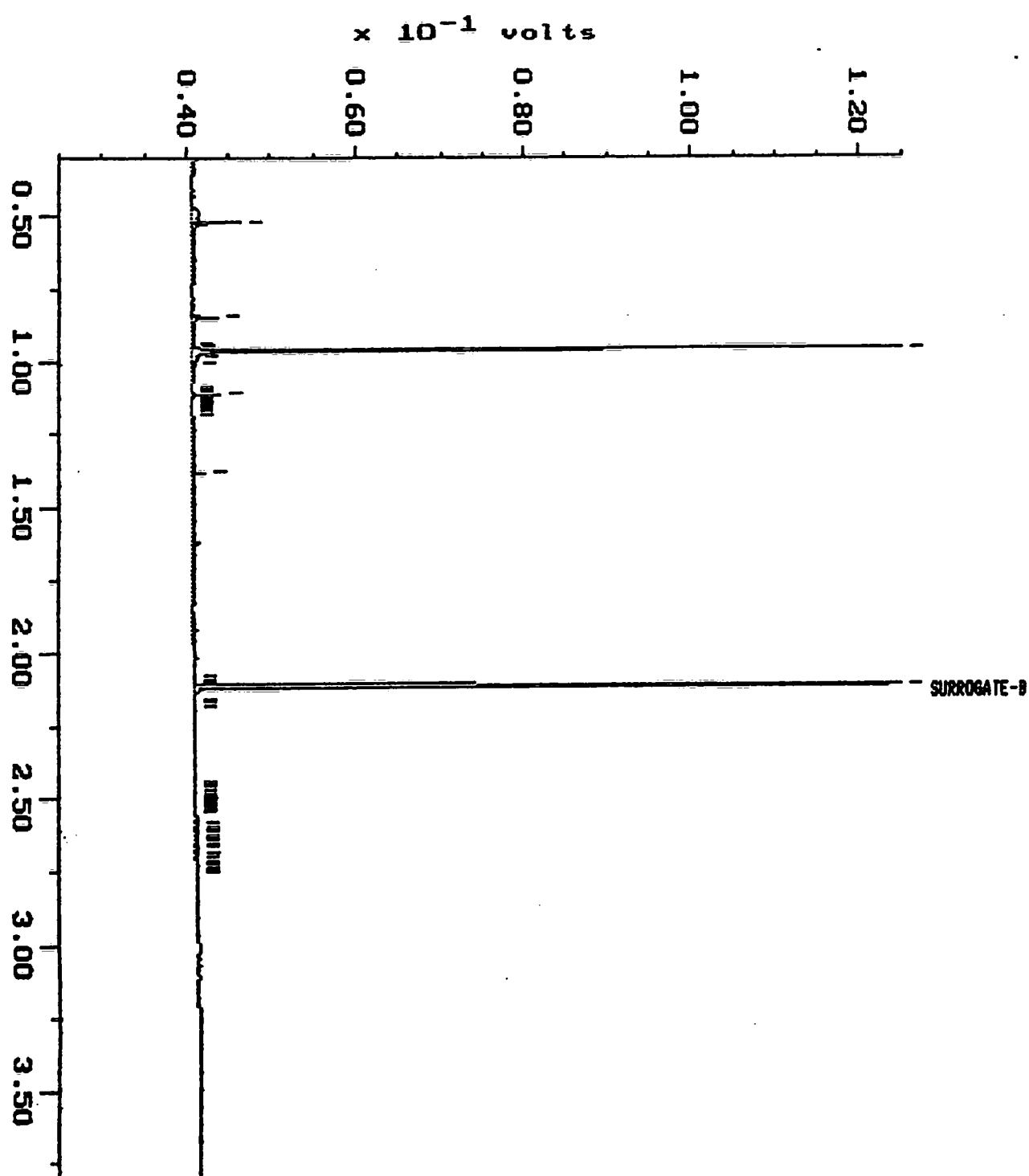
Filename: 1024BE19
Operator: PEA



Sample: 9110-290-11
Acquired: 25-OCT-91 14:23
Inj Vol: 1.00

Channel: BERT
Method: L:\BRO2\MAXDATA\BERT\FUEL1024

Filename: 1024BE26
Operator: PEA





~~Surfing - Seen - Associate~~
200 Rush Landing Road
P.O. Box 6107
Novato, California 94948
415/892-0621
Telecopy: 415/892-1586

CHAIN OF CUSTODY FORM

Job Number: 09695, 337.02
Name/Location: VW & R BOISE
Project Manager: MICHAEL WATSON

Samplers: GARY LIEPFERMAN
MICHAEL WATSON

Recorder: S. Michelle Watson
(Signature Required)

SOURCE CODE	MATRIX				#CONTAINERS & PRESERV.			SAMPLE NUMBER OR LAB NUMBER			DATE			
	Water	Sediment	Soil	Oil	Unpres.	H ₂ SO ₄	HNO ₃	Yr	Wk	Seq	Yr	Mo	Dy	Time
50	X				1			911022204	911	1022				
50	X				1			911022206	911	1022				
50	X				1			911022209	911	1022				
50	X				1			911022211	911	1022				
50	X				1			911022215	911	1022				
50	X				1			911022218	911	1022				
50	X				1			911022220	911	1022				
50	X				1			911022222	911	1022				
50	X				1			911022224	911	1022				
50	X				1			911022229	911	1022				

STATION DESCRIPTION/ NOTES

CHAIN OF CUSTODY RECORD		
(e) Watson	RECEIVED BY: (Signature)	DATE/TIME
(e)	RECEIVED BY: (Signature)	DATE/TIME
(e)	RECEIVED BY: (Signature)	DATE/TIME
(e)	RECEIVED BY: (Signature)	DATE/TIME
	DATE/TIME	RECEIVED FOR LAB BY: DATE/TIME
DHL EXPRESS	10/23/97 11:00 AM	



Wardling Lawson Associates
200 Rush Landing Road
P.O. Box 6107
Novato, California 94948
415/882-0621
Telex: 415/882-1588

CHAIN OF CUSTODY FORM

Job Number: 091695, 337.02
Name/Location: VW - R Boise
Project Manager: Michelle Watson

Samplers: S. Michelle Wietzen
Gary Lieberman

Recorder: Shellyation;
(Signature Required)

Lab: ATI - Renton WA
9/10-290

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) <i>S. Michelle Watson</i>	RECEIVED BY: (Signature)	DATE/TIM.	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME	
DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT	<i>DHL EXPRESS</i>		



Analytical**Technologies**, Inc.

560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 9110-290

November 7, 1991

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94945

Attention : Michelle Watson

Project Number : 09695,337.02

Project Name : VW&R Boise

On October 23, 1991, Analytical Technologies, Inc., received 12 soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and quality control data are enclosed.

Please note that the results for the 8015 modified analyses are not corrected for moisture content.

Karen L. Mixon
Karen L. Mixon
Senior Project Manager

Frederick W. Grothkopp
Frederick W. Grothkopp
Laboratory Manager

FWG/hal/elf



Analytical Technologies, Inc.

ATI I.D. # 9110-290

SAMPLE CROSS REFERENCE SHEET

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
9110-290-1	91102204	10/22/91	SOIL
9110-290-2	91102206	10/22/91	SOIL
9110-290-3	91102209	10/22/91	SOIL
9110-290-4	91102211	10/22/91	SOIL
9110-290-5	91102215	10/22/91	SOIL
9110-290-6	91102218	10/22/91	SOIL
9110-290-7	91102220	10/22/91	SOIL
9110-290-8	91102222	10/22/91	SOIL
9110-290-9	91102224	10/22/91	SOIL
9110-290-10	91102229	10/22/91	SOIL
9110-290-11	91102231	10/22/91	SOIL
9110-290-12	91102233	10/22/91	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	12

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of the report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.



ATI I.D. # 9110-290

ANALYTICAL SCHEDULE

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE

ANALYSIS	TECHNIQUE	REFERENCE	LAB
PURGEABLE AROMATICS	GC/PID	EPA 8020	R
PURGEABLE HALOCARBONS	GC/ELCD	EPA 8010	R
FUEL HYDROCARBONS	GC/FID	EPA 8015 MODIFIED	R
MOISTURE	GRAVIMETRIC	CLP SOW ILM01.0	R

R = ATI - Renton
 SD = ATI - San Diego
 PHX = ATI - Phoenix
 PNR = ATI - Pensacola
 FC = ATI - Fort Collins
 SUB = Subcontract

ATI I.D. # 9110-290

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : REAGENT BLANK
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : N/A
 DATE RECEIVED : N/A
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/29/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.050
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.050
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
1,2-DIBROMOETHANE (EDB)	<0.025
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE (EDC)	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.19
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.050
TOTAL XYLEMES	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	123
BROMOFLUOROBENZENE	114

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102204
SAMPLE MATRIX : SOIL
EPA METHOD : 8010/8020
RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/23/91
DATE ANALYZED : 10/24/91
UNITS : mg/Kg
DILUTION FACTOR : 5

COMPOUNDS RESULTS -----

BENZENE	<0.13
BROMODICHLOROMETHANE	<0.050
BROMOFORM	<0.050
BROMOMETHANE	<0.25
CARBON TETRACHLORIDE	<0.050
CHLOROBENZENE	<0.13
CHLOROETHANE	<0.25
CHLOROFORM	<0.050
CHLOROMETHANE	<0.50
1,2-DIBROMOETHANE (EDB)	<0.13
1,2-DICHLOROBENZENE	<0.13
1,3-DICHLOROBENZENE	<0.13
1,4-DICHLOROBENZENE	<0.13
DIBROMOCHLOROMETHANE	<0.050
1,1-DICHLOROETHANE	<0.050
1,2-DICHLOROETHANE (EDC)	<0.050
1,1-DICHLOROETHENE	<0.050
CIS-1,2-DICHLOROETHENE	1.3
TRANS-1,2-DICHLOROETHENE	<0.050
1,2-DICHLOROPROPANE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050
ETHYLBENZENE	<0.13
METHYLENE CHLORIDE	0.75 B
1,1,2,2-TETRACHLOROETHANE	<0.050
TETRACHLOROETHENE	26,000 D
TOLUENE	<0.13
1,1,1-TRICHLOROETHANE	<0.050
1,1,2-TRICHLOROETHANE	<0.050
TRICHLOROETHENE	3.1
TRICHLOROFUOROMETHANE	<0.13
VINYL CHLORIDE	<0.25
TOTAL XYLEMES	<0.13

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	70
BROMOFLUOROBENZENE	101

B = Analyte is found in the associated blank as well as the sample.
D = Value from a 5,000,000 fold diluted analysis.

VOLATILE ORGANICS ANALYSIS
DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102206
SAMPLE MATRIX : SOIL
EPA METHOD : 8010/8020
RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/23/91
DATE ANALYZED : 10/24/91
UNITS : mg/Kg
DILUTION FACTOR : 5

COMPOUNDS

RESULTS

BENZENE	<0.13
BROMODICHLOROMETHANE	<0.050
BROMOFORM	<0.050
BROMOMETHANE	<0.25
CARBON TETRACHLORIDE	0.18
CHLOROBENZENE	<0.13
CHLOROETHANE	<0.25
CHLOROFORM	<0.050
CHLOROMETHANE	<0.50
1,2-DIBROMOETHANE (EDB)	<0.13
1,2-DICHLOROBENZENE	<0.13
1,3-DICHLOROBENZENE	<0.13
1,4-DICHLOROBENZENE	<0.13
DIBROMOCHLOROMETHANE	<0.050
1,1-DICHLOROETHANE	<0.050
1,2-DICHLOROETHANE (EDC)	<0.050
1,1-DICHLOROETHENE	<0.050
CIS-1,2-DICHLOROETHENE	<0.050
TRANS-1,2-DICHLOROETHENE	<0.050
1,2-DICHLOROPROPANE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050
ETHYLBENZENE	<0.13
METHYLENE CHLORIDE	0.73 B
1,1,2,2-TETRACHLOROETHANE	<0.050
TETRACHLOROETHENE	3,100 D
TOLUENE	<0.13
1,1,1-TRICHLOROETHANE	<0.050
1,1,2-TRICHLOROETHANE	<0.050
TRICHLOROETHENE	0.40
TRICHLOROFLUOROMETHANE	<0.13
VINYL CHLORIDE	<0.25
TOTAL XYLENES	<0.13

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	55
BROMOFLUOROBENZENE	106

B = Analyte is found in the associated blank as well as the sample.
D = Value from a 1,000,000 fold diluted analysis.



ATI I.D. # 9110-290-3

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102209
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/24/91
 UNITS : mg/Kg
 DILUTION FACTOR : 5

COMPOUNDS**RESULTS**

BENZENE	<0.13
BROMODICHLOROMETHANE	<0.050
BROMOFORM	<0.050
BROMOMETHANE	<0.25
CARBON TETRACHLORIDE	<0.050
CHLOROBENZENE	<0.13
CHLOROETHANE	<0.25
CHLOROFORM	<0.050
CHLOROMETHANE	<0.50
1,2-DIBROMOETHANE (EDB)	<0.13
1,2-DICHLOROBENZENE	<0.13
1,3-DICHLOROBENZENE	<0.13
1,4-DICHLOROBENZENE	<0.13
DIBROMOCHLOROMETHANE	<0.050
1,1-DICHLOROETHANE	<0.050
1,2-DICHLOROETHANE (EDC)	<0.050
1,1-DICHLOROETHENE	<0.050
CIS-1,2-DICHLOROETHENE	<0.050
TRANS-1,2-DICHLOROETHENE	<0.050
1,2-DICHLOROPROPANE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050
ETHYLBENZENE	<0.13
METHYLENE CHLORIDE	0.76 B
1,1,2,2-TETRACHLOROETHANE	<0.050
TETRACHLOROETHENE	1,100 D
TOLUENE	<0.13
1,1,1-TRICHLOROETHANE	<0.050
1,1,2-TRICHLOROETHANE	<0.050
TRICHLOROETHENE	<0.050
TRICHLOROFLUOROMETHANE	<0.13
VINYL CHLORIDE	<0.25
TOTAL XYLENES	<0.13

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	34 H
BROMOFLUOROBENZENE	105

B = Analyte is found in the associated blank as well as the sample.

D = Value from a 1,000,000 fold diluted analysis.

H = Out of limits.

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102211
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/24/91
 UNITS : mg/Kg
 DILUTION FACTOR : 5

COMPOUNDS	RESULTS
BENZENE	<0.13
BROMODICHLOROMETHANE	<0.050
BROMOFORM	<0.050
BROMOMETHANE	<0.25
CARBON TETRACHLORIDE	<0.050
CHLOROBENZENE	<0.13
CHLOROETHANE	<0.25
CHLOROFORM	<0.050
CHLOROMETHANE	<0.50
1,2-DIBROMOETHANE (EDB)	<0.13
1,2-DICHLOROBENZENE	<0.13
1,3-DICHLOROBENZENE	<0.13
1,4-DICHLOROBENZENE	<0.13
DIBROMOCHLOROMETHANE	<0.050
1,1-DICHLOROETHANE	<0.050
1,2-DICHLOROETHANE (EDC)	<0.050
1,1-DICHLOROETHENE	<0.050
CIS-1,2-DICHLOROETHENE	0.52
TRANS-1,2-DICHLOROETHENE	<0.050
1,2-DICHLOROPROPANE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050
ETHYLBENZENE	<0.13
METHYLENE CHLORIDE	0.63 B
1,1,2,2-TETRACHLOROETHANE	<0.050
TETRACHLOROETHENE	3,300 D
TOLUENE	<0.13
1,1,1-TRICHLOROETHANE	<0.050
1,1,2-TRICHLOROETHANE	<0.050
TRICHLOROETHENE	1.5
TRICHLOROFLUOROMETHANE	<0.13
VINYL CHLORIDE	<0.25
TOTAL XYLENES	<0.13

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	30 H
BROMOFLUOROBENZENE	110

B = Analyte is found in the associated blank as well as the sample.

D = Value from a 1,000,000 fold diluted analysis.

H = Out of Limits.

ATI I.D. # 9110-290-5

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102215
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 5

COMPOUNDS	RESULTS
BENZENE	<0.13
BROMODICHLOROMETHANE	<0.050
BROMOFORM	<0.050
BROMOMETHANE	<0.25
CARBON TETRACHLORIDE	<0.050
CHLOROBENZENE	<0.13
CHLOROETHANE	<0.25
CHLOROFORM	<0.050
CHLOROMETHANE	<0.50
1,2-DIBROMOETHANE (EDB)	<0.13
1,2-DICHLOROBENZENE	<0.13
1,3-DICHLOROBENZENE	<0.13
1,4-DICHLOROBENZENE	<0.13
DIBROMOCHLOROMETHANE	<0.050
1,1-DICHLOROETHANE	<0.050
1,2-DICHLOROETHANE (EDC)	<0.050
1,1-DICHLOROETHENE	<0.050
CIS-1,2-DICHLOROETHENE	<0.050
TRANS-1,2-DICHLOROETHENE	<0.050
1,2-DICHLOROPROPANE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050
ETHYLBENZENE	<0.13
METHYLENE CHLORIDE	0.65 B
1,1,2,2-TETRACHLOROETHANE	<0.050
TETRACHLOROETHENE	840 D
TOLUENE	<0.13
1,1,1-TRICHLOROETHANE	<0.050
1,1,2-TRICHLOROETHANE	<0.050
TRICHLOROETHENE	0.51
TRICHLOROFLUOROMETHANE	<0.13
VINYL CHLORIDE	<0.25
TOTAL XYLENES	<0.13

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	27 H
BROMOFLUOROBENZENE	112

B = Analyte is found in the associated blank as well as the sample.
 D = Value from a 1,000,000 fold diluted analysis.
 H = Out of Limits.



ATI I.D. # 9110-290-6

VOLATILE ORGANICS ANALYSIS DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102218
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS	RESULTS
BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.050
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.050
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
1,2-DIBROMOETHANE (EDB)	<0.025
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE (EDC)	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	0.014
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.20 B
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	4.0 D
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.050
TOTAL XYLENES	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	69
BROMOFLUOROBENZENE	102

B = Analyte is found in the associated blank as well as the sample.
 D = Value from a ten fold diluted analysis.

ATI I.D. # 9110-290-7

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102220
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.050
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.050
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
1,2-DIBROMOETHANE (EDB)	<0.025
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE (EDC)	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.22 B
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.23
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.050
TOTAL XYLENES	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	108
BROMOFLUOROBENZENE	109

B = Analyte is found in the associated blank as well as the sample.



ATI I.D. # 9110-290-8

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102222
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS

BENZENE
 BROMODICHLOROMETHANE
 BROMOFORM
 BROMOMETHANE
 CARBON TETRACHLORIDE
 CHLOROBENZENE
 CHLOROETHANE
 CHLOROFORM
 CHLOROMETHANE
 1,2-DIBROMOETHANE (EDB)
 1,2-DICHLOROBENZENE
 1,3-DICHLOROBENZENE
 1,4-DICHLOROBENZENE
 DIBROMOCHLOROMETHANE
 1,1-DICHLOROETHANE
 1,2-DICHLOROETHANE (EDC)
 1,1-DICHLOROETHENE
 CIS-1,2-DICHLOROETHENE
 TRANS-1,2-DICHLOROETHENE
 1,2-DICHLOROPROPANE
 CIS-1,3-DICHLOROPROPENE
 TRANS-1,3-DICHLOROPROPENE
 ETHYLBENZENE
 METHYLENE CHLORIDE
 1,1,2,2-TETRACHLOROETHANE
 TETRACHLOROETHENE
 TOLUENE
 1,1,1-TRICHLOROETHANE
 1,1,2-TRICHLOROETHANE
 TRICHLOROETHENE
 TRICHLOROFUOROMETHANE
 VINYL CHLORIDE
 TOTAL XYLENES

RESULTS

<0.025	
<0.010	
<0.010	
<0.050	
<0.010	
<0.025	
<0.050	
<0.010	
<0.10	
<0.025	
<0.025	
<0.025	
<0.025	
<0.010	
<0.010	
<0.010	
<0.010	
<0.010	
<0.010	
<0.010	
0.32	B
<0.010	
0.68	
<0.025	
0.016	
<0.010	
<0.010	
<0.025	
<0.050	
<0.025	

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	113
BROMOFLUOROBENZENE	115

B = Analyte is found in the associated blank as well as the sample.

ATI I.D. # 9110-290-9

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102224
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/29/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.050
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.050
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
1,2-DIBROMOETHANE (EDB)	<0.025
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE (EDC)	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.16 B
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.014
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFUOROMETHANE	<0.025
VINYL CHLORIDE	<0.050
TOTAL XYLEMES	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	117
BROMOFLUOROBENZENE	126

B = Analyte is found in the associated blank as well as the sample.

ATI I.D. # 9110-290-10

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102229
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/29/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.050
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.050
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
1,2-DIBROMOETHANE (EDB)	<0.025
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE (EDC)	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.23 B
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.050
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.050
TOTAL XYLEMES	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	109
BROMOFLUOROBENZENE	121

B = Analyte is found in the associated blank as well as the sample.

ATI I.D. # 9110-290-11

 VOLATILE ORGANICS ANALYSIS
 DATA SUMMARY

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102231
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/29/91
 UNITS : mg/Kg
 DILUTION FACTOR : 5

COMPOUNDS	RESULTS
BENZENE	<0.13
BROMODICHLOROMETHANE	<0.050
BROMOFORM	<0.050
BROMOMETHANE	<0.25
CARBON TETRACHLORIDE	<0.050
CHLOROBENZENE	<0.13
CHLOROETHANE	<0.25
CHLOROFORM	<0.050
CHLOROMETHANE	<0.50
1,2-DIBROMOETHANE (EDB)	<0.13
1,2-DICHLOROBENZENE	<0.13
1,3-DICHLOROBENZENE	<0.13
1,4-DICHLOROBENZENE	<0.13
DIBROMOCHLOROMETHANE	<0.050
1,1-DICHLOROETHANE	<0.050
1,2-DICHLOROETHANE (EDC)	<0.050
1,1-DICHLOROETHENE	<0.050
CIS-1,2-DICHLOROETHENE	<0.050
TRANS-1,2-DICHLOROETHENE	<0.050
1,2-DICHLOROPROPANE	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050
ETHYLBENZENE	<0.13
METHYLENE CHLORIDE	1.1 B
1,1,2,2-TETRACHLOROETHANE	<0.050
TETRACHLOROETHENE	0.86
TOLUENE	<0.13
1,1,1-TRICHLOROETHANE	<0.050
1,1,2-TRICHLOROETHANE	<0.050
TRICHLOROETHENE	<0.050
TRICHLOROFLUOROMETHANE	<0.13
VINYL CHLORIDE	<0.25
TOTAL XYLENES	<0.13

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	68
BROMOFLUOROBENZENE	69

B = Analyte is found in the associated blank as well as the sample.

ATI I.D. # 9110-290-12

**VOLATILE ORGANICS ANALYSIS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102233
 SAMPLE MATRIX : SOIL
 EPA METHOD : 8010/8020
 RESULTS BASED ON DRY WEIGHT

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/23/91
 DATE ANALYZED : 10/29/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

BENZENE	<0.025
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.050
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.050
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
1,2-DIBROMOETHANE (EDB)	<0.025
1,2-DICHLOROBENZENE	<0.025
1,3-DICHLOROBENZENE	<0.025
1,4-DICHLOROBENZENE	<0.025
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE (EDC)	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
ETHYLBENZENE	<0.025
METHYLENE CHLORIDE	0.15 B
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.21
TOLUENE	<0.025
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.050
TOTAL XYLENES	<0.025

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	104
BROMOFLUOROBENZENE	115

B = Analyte is found in the associated blank as well as the sample.



ATI I.D. # 9110-290

**VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA**

CLIENT : HARDING LAWSON ASSOCIATES SAMPLE I.D. # : 9110-273-5
 PROJECT # : 09695,337.02 DATE EXTRACTED : 10/22/91
 PROJECT NAME : VW&R BOISE DATE ANALYZED : 10/24/91
 EPA METHOD : 8010/8020 UNITS : mg/Kg
 SAMPLE MATRIX : SOIL

COMPOUNDS	SAMPLE	SPIKE	SPIKED	%	DUP.	DUP.	
	RESULT	ADDED	RESULT	REC.	SPIKED SAMPLE	% REC.	RPD
BENZENE	<0.025	0.400	0.381	95	0.384	96	1
CHLOROBENZENE	<0.025	0.400	0.421	105	0.424	106	1
1,1-DICHLOROETHENE	<0.010	0.400	0.308	77	0.295	74	4
TOLUENE	<0.025	0.400	0.440	110	0.435	109	1
TRICHLOROETHENE	<0.010	0.400	0.353	88	0.343	86	3

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Duplicate Result})|}{\text{Average Result}} \times 100$$

**VOLATILE ORGANICS ANALYSIS
QUALITY CONTROL DATA**

CLIENT : HARDING LAWSON ASSOCIATES SAMPLE I.D. # : BLANK SPIKE
 PROJECT # : 09695,337.02 DATE EXTRACTED : 10/23/91
 PROJECT NAME : VW&R BOISE DATE ANALYZED : 10/28/91
 EPA METHOD : 8010/8020 UNITS : mg/Kg
 SAMPLE MATRIX : SOIL

COMPOUNDS	SAMPLE	SPIKE	SPIKED	%	SPIKED	DUP.	DUP.
	RESULT	ADDED	RESULT	REC.	SAMPLE	REC.	RPD
BENZENE	<0.025	0.400	0.480	120	N/A	N/A	N/A
CHLOROBENZENE	<0.025	0.400	0.465	116	N/A	N/A	N/A
1,1-DICHLOROETHENE	<0.010	0.400	0.408	102	N/A	N/A	N/A
TOLUENE	<0.025	0.400	0.416	104	N/A	N/A	N/A
TRICHLOROETHENE	<0.010	0.400	0.442	111	N/A	N/A	N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{|(\text{Spike Result} - \text{Duplicate Result})|}{\text{Average Result}} \times 100$$



ATI I.D. # 9110-290

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695,337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : REAGENT BLANK
SAMPLE MATRIX : SOIL
METHOD : 8015 (MODIFIED)

DATE SAMPLED : N/A
DATE RECEIVED : N/A
DATE EXTRACTED : 10/24/91
DATE ANALYZED : 10/24/91
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C7 - C12
GASOLINE

FUEL HYDROCARBONS
HYDROCARBON RANGE
HYDROCARBON QUANTITATION USING

<5
C12 - C24
DIESEL



ATI I.D. # 9110-290-1

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102204
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C7 - C12
 GASOLINE

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C12 - C24
 DIESEL

Please note: These results represent tetrachloroethylene subtracted data.



ATI I.D. # 9110-290-2

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102206
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C7 - C12
 GASOLINE

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C12 - C24
 DIESEL

Please note: These results represent tetrachloroethene subtracted data.



ATI I.D. # 9110-290-3

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
 PROJECT # : 09695,337.02
 PROJECT NAME : VW&R BOISE
 CLIENT I.D. : 91102209
 SAMPLE MATRIX : SOIL
 METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
 DATE RECEIVED : 10/23/91
 DATE EXTRACTED : 10/24/91
 DATE ANALYZED : 10/25/91
 UNITS : mg/Kg
 DILUTION FACTOR : 1

COMPOUNDS

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

RESULTS

<5
 C7 - C12
 GASOLINE

<5
 C12 - C24
 DIESEL

Please note: These results represent tetrachloroethene subtracted data.



ATI I.D. # 9110-290-4

**FUEL HYDROCARBONS
DATA SUMMARY**

CLIENT : HARDING LAWSON ASSOCIATES
PROJECT # : 09695, 337.02
PROJECT NAME : VW&R BOISE
CLIENT I.D. : 91102211
SAMPLE MATRIX : SOIL
METHOD : 8015 (MODIFIED)

DATE SAMPLED : 10/22/91
DATE RECEIVED : 10/23/91
DATE EXTRACTED : 10/24/91
DATE ANALYZED : 10/25/91
UNITS : mg/Kg
DILUTION FACTOR : 1

COMPOUNDS**RESULTS**

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C7 - C12
 GASOLINE

FUEL HYDROCARBONS
 HYDROCARBON RANGE
 HYDROCARBON QUANTITATION USING

<5
 C12 - C24
 DIESEL

Please note: These results represent tetrachloroethene subtracted data.

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-1 @ 5.0

Total Sample Weight (g): 203.0

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%):

Particle Diameter (mm):

Gravel : 0.6

@ 60% Passing : ---

Sand : 20.2

@ 30% Passing : ---

Fines : 79.2

@ 10% Passing : ---

Coefficient of Uniformity: ----

Coefficient of Curvature: ----

Soil Classification: YELLOW-BROWN FAT CLAY W/SAND (CH*)

Frost Classification: --

Data Entry By: CLM

File #: 756

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-1 @ 5.0 Data File : TEST0756

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	0.0	100.0
No. 4	4.750	1.2	99.4
No. 8	2.360	3.9	98.1
No. 10	2.000	4.7	97.7
No. 16	1.180	7.6	96.3
No. 30	0.600	12.9	93.6
No. 50	0.300	23.1	88.6
No. 100	0.150	32.0	84.2
No. 200	0.075	42.2	79.2

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-1 @ 10.0

Total Sample Weight (g): 189.8

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 46.0 @ 60% Passing : 5.8028

Sand : 47.9 @ 30% Passing : 0.5703

Fines : 6.1 @ 10% Passing : 0.1643

Coefficient of Uniformity: 3.53E 1

Coefficient of Curvature: 3.41E-1

Soil Classification: BROWN SAND W/CLAY AND GRAVEL (SP-SC*)

Frost Classification: --

Data Entry By: CLM

File #: 757

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-1 @ 10.0 Data File : TEST0757

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	47.9	74.8
No. 4	4.750	87.3	54.0
No. 8	2.360	107.7	43.3
No. 10	2.000	111.7	41.1
No. 16	1.180	120.9	36.3
No. 30	0.600	130.9	31.0
No. 50	0.300	157.7	16.9
No. 100	0.150	172.8	9.0
No. 200	0.075	178.3	6.1

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-1 @ 14.0

Total Sample Weight (g): 806.3

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%):

Particle Diameter (mm):

Gravel : 59.3 @ 60% Passing : 11.0022

Sand : 37.6 @ 30% Passing : 1.9997

Fines : 3.2 @ 10% Passing : 0.2525

Coefficient of Uniformity: 4.36E 1

Coefficient of Curvature: 1.44E 0

Soil Classification: BROWN GRAVEL W/SAND (GW)

Frost Classification: --

Data Entry By: CLM File #: 758

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-1 @ 14.0 Data File : TEST0758

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	187.5	76.7
3/8 in	9.500	358.8	55.5
No. 4	4.750	477.8	40.7
No. 8	2.360	549.4	31.9
No. 10	2.000	564.4	30.0
No. 16	1.180	596.8	26.0
No. 30	0.600	626.8	22.3
No. 50	0.300	712.7	11.6
No. 100	0.150	764.8	5.1
No. 200	0.075	780.9	3.2

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-2 @ 4.5

Total Sample Weight (g): 223.5

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 0.1 @ 60% Passing : ---

Sand : 13.7 @ 30% Passing : ---

Fines : 86.1 @ 10% Passing : ---

Coefficient of Uniformity: ----

Coefficient of Curvature: ----

Soil Classification: BROWN FAT CLAY (CH*)

Frost Classification: --

Data Entry By: CLM File #: 759

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-2 @ 4.5 Data File : TEST0759

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	0.0	100.0
No. 4	4.750	0.3	99.9
No. 8	2.360	0.9	99.6
No. 10	2.000	1.2	99.5
No. 16	1.180	2.2	99.0
No. 30	0.600	4.5	98.0
No. 50	0.300	14.6	93.5
No. 100	0.150	21.7	90.3
No. 200	0.075	31.0	86.1

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-2 @ 6.5

Total Sample Weight (g): 241.2

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 0.0 @ 60% Passing : 0.1682

Sand : 49.5 @ 30% Passing : ----

Fines : 50.5 @ 10% Passing : ----

Coefficient of Uniformity: ----

Coefficient of Curvature: ----

Soil Classification: BROWN SANDY FAT CLAY (CH*)

Frost Classification: --

Data Entry By: CLM File #: 760

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-2 @ 6.5 Data File : TEST0760

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	0.0	100.0
No. 4	4.750	0.0	100.0
No. 8	2.360	1.7	99.3
No. 10	2.000	2.5	99.0
No. 16	1.180	6.2	97.4
No. 30	0.600	17.8	92.6
No. 50	0.300	72.2	70.1
No. 100	0.150	101.3	58.0
No. 200	0.075	119.4	50.5

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-2 @ 11.5

Total Sample Weight (g): 387.3

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 32.6 @ 60% Passing : 2.1325

Sand : 53.8 @ 30% Passing : 0.2084

Fines : 13.6 @ 10% Passing : 0.0580

Coefficient of Uniformity: 3.68E 1

Coefficient of Curvature: 3.51E-1

Soil Classification: ORANGE-BROWN CLAYEY SAND W/GRAVEL
(SC*)

Frost Classification: --

Data Entry By: CLM

File #: 761

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-2 @ 11.5 Data File : TEST0761

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	67.9	82.5
3/8 in	9.500	94.8	75.5
No. 4	4.750	126.1	67.4
No. 8	2.360	151.0	61.0
No. 10	2.000	157.4	59.4
No. 16	1.180	169.7	56.2
No. 30	0.600	183.2	52.7
No. 50	0.300	242.4	37.4
No. 100	0.150	297.0	23.3
No. 200	0.075	334.6	13.6

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-3 @ 3.5

Total Sample Weight (g): 828.0

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: ---

Plasticity Index: ---

Soil Composition (%):

Particle Diameter (mm):

Gravel : 43.2

@ 60% Passing : 6.6461

Sand : 49.6

@ 30% Passing : 0.5338

Fines : 7.2

@ 10% Passing : 0.1256

Coefficient of Uniformity: 5.29E 1

Coefficient of Curvature: 3.41E-1

Soil Classification: YELLOW-BROWN SAND W/CLAY AND GRAVEL
(SP-SC*)

Frost Classification: --

Data Entry By: CLM

File #: 762

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-3 @ 3.5 Data File : TEST0762

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	127.3	84.6
3/4 in	19.000	233.9	71.8
3/8 in	9.500	302.8	63.4
No. 4	4.750	357.9	56.8
No. 8	2.360	398.1	51.9
No. 10	2.000	410.9	50.4
No. 16	1.180	473.7	42.8
No. 30	0.600	562.1	32.1
No. 50	0.300	665.8	19.6
No. 100	0.150	737.3	11.0
No. 200	0.075	768.2	7.2

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-3 @ 8.5

Total Sample Weight (g): 274.4

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: ---

Plasticity Index: ---

Soil Composition (%):

Particle Diameter (mm):

Gravel : 8.4

@ 60% Passing : 0.2560

Sand : 52.4

@ 30% Passing : ---

Fines : 39.1

@ 10% Passing : ---

Coefficient of Uniformity: ----

Coefficient of Curvature: ----

Soil Classification: BROWN CLAYEY SAND

(SC*)

Frost Classification: --

Data Entry By: CLM

File #: 763

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-3 @ 8.5 Data File : TEST0763

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	0.0	100.0
No. 4	4.750	23.1	91.6
No. 8	2.360	29.8	89.1
No. 10	2.000	31.6	88.5
No. 16	1.180	40.2	85.3
No. 30	0.600	54.0	80.3
No. 50	0.300	100.5	63.4
No. 100	0.150	141.0	48.6
No. 200	0.075	167.0	39.1

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-3 @ 11.0

Total Sample Weight (g): 144.1

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%):

Particle Diameter (mm):

Gravel : 47.1 @ 60% Passing : 7.4388

Sand : 48.4 @ 30% Passing : 0.4657

Fines : 4.5 @ 10% Passing : 0.1994

Coefficient of Uniformity: 3.73E 1

Coefficient of Curvature: 1.46E-1

Soil Classification: BROWN SAND W/GRAVEL (SP)

Frost Classification: --

Data Entry By: CLM

File #: 764

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-3 @ 11.0 Data File : TEST0764

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	12.4	91.4
3/8 in	9.500	52.1	63.8
No. 4	4.750	67.8	52.9
No. 8	2.360	75.5	47.6
No. 10	2.000	77.0	46.6
No. 16	1.180	82.0	43.1
No. 30	0.600	88.4	38.7
No. 50	0.300	122.5	15.0
No. 100	0.150	134.7	6.5
No. 200	0.075	137.6	4.5

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-4 @ 4.5

Total Sample Weight (g): 308.3

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 0.6 @ 60% Passing : ---

Sand : 21.7 @ 30% Passing : ---

Fines : 77.7 @ 10% Passing : ---

Coefficient of Uniformity: ----

Coefficient of Curvature: ----

Soil Classification: BROWN FAT CLAY W/SAND (CH*)

Frost Classification: --

Data Entry By: CLM

File #: 765

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-4 @ 4.5 Data File : TEST0765

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	0.0	100.0
No. 4	4.750	1.9	99.4
No. 8	2.360	9.4	97.0
No. 10	2.000	12.2	96.0
No. 16	1.180	20.1	93.5
No. 30	0.600	29.4	90.5
No. 50	0.300	40.7	86.8
No. 100	0.150	52.6	82.9
No. 200	0.075	68.9	77.7

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-4 @ 10.5

Total Sample Weight (g): 360.6

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 52.6 @ 60% Passing : 11.3761

Sand : 38.7 @ 30% Passing : 0.6247

Fines : 8.7 @ 10% Passing : 0.1036

Coefficient of Uniformity: 1.10E 2

Coefficient of Curvature: 3.31E-1

Soil Classification: BROWN GRAVEL W/CLAY AND SAND (GP-GC*)

Frost Classification: --

Data Entry By: CLM

File #: 766

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-4 @ 10.5 Data File : TEST0766

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	106.5	70.5
3/8 in	9.500	157.5	56.3
No. 4	4.750	189.7	47.4
No. 8	2.360	211.8	41.3
No. 10	2.000	218.4	39.4
No. 16	1.180	235.4	34.7
No. 30	0.600	253.5	29.7
No. 50	0.300	295.4	18.1
No. 100	0.150	319.1	11.5
No. 200	0.075	329.3	8.7

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project Name: VWR BOISE
Project Number: 09695.337.02

Test Date: 10-30-1991
Location: B-4 @ 14.0

Total Sample Weight (g): 152.7

Percent Passing No. 10 Sieve : 0.0

Representative Sample Weight (g): ----

PI Results (used in determining fines classification)

Liquid Limit: --- Plasticity Index: ---

Soil Composition (%): Particle Diameter (mm):

Gravel : 23.6 @ 60% Passing : 1.7042

Sand : 58.9 @ 30% Passing : 0.2521

Fines : 17.5 @ 10% Passing : 0.0272

Coefficient of Uniformity: 6.27E 1

Coefficient of Curvature: 1.37E 0

Soil Classification: BROWN CLAYEY SAND W/GRAVEL (SC*)

Frost Classification: --

Data Entry By: CLM

File #: 767

Particle Size Analysis
Sieve Method
HLA Laboratory Analysis Routines Ver 3.0

Project : VWR BOISE ID : 09695.337.02 Test Date : 10-30-1991

Data Entry By : CLM Location : B-4 @ 14.0 Data File : TEST0767

Sieve Name	Sieve Size (mm)	Cum. Weight Retained (g)	Percent of Total Weight Passing
5.000 in	125.000	0.0	100.0
3.000 in	75.000	0.0	100.0
1.500 in	37.500	0.0	100.0
3/4 in	19.000	0.0	100.0
3/8 in	9.500	17.2	88.7
No. 4	4.750	36.1	76.4
No. 8	2.360	53.2	65.2
No. 10	2.000	57.5	62.3
No. 16	1.180	69.3	54.6
No. 30	0.600	81.0	47.0
No. 50	0.300	103.1	32.5
No. 100	0.150	118.2	22.6
No. 200	0.075	126.0	17.5

DISTRIBUTION

**SOIL BORING INVESTIGATION
FORMER VW&R FACILITY
BOISE, IDAHO
December 19, 1991**

Copy No. 19

Copy No.

2 copies: **Van Waters & Rogers Inc.** **1-2**
6100 Carillon Point
Kirkland, Washington 98033

Attention: Mr. Wayne Grotheer

2 copies: **Van Waters & Rogers Inc.** **3-4**
50 South 45th Avenue
Phoenix, Arizona 85043-3907

Attention: Ms. Gail Clement

13 copies: **Preston Thorgrimson Shidler** **5-17**
Gates & Ellis
Attorneys at Law
5400 Columbia Center
701 Fifth Avenue
Seattle, Washington 98104-7078

Attention: Mr. Scott Vokey

3 copies: **Idaho Department of Health and Welfare** **18-20**
Division of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1253

Attention: Sally Goodell

DISTRIBUTION
(continued)

	<u>Copy No.</u>
3 copies: Job File	21-23
1 copy: QC/Bound Report File	24
1 copy: Unbound Original File	25

SMW/CRS/elb/T20790-H

QUALITY CONTROL REVIEWER

Bruce White for
Eric G. Williams
Senior Hydrogeologist

Harding Lawson Associates



Transmittal/Memorandum

To: Harding Lawson Associates
Novato Office

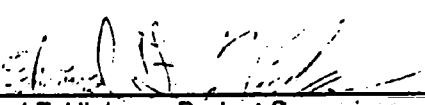
Attention: Michelle Watson

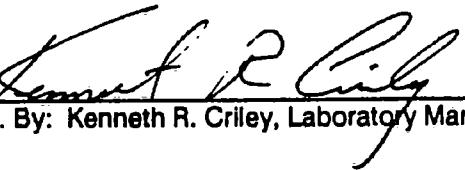
From: Edward F. Hinkson, Project Supervisor
Date: November 1, 1991
Subject: Laboratory Test Results; VWR Boise
Job No.: 09695.337.02 / LRN 2847

Remarks: Enclosed are the final test results for the subject project(s). Samples were submitted to our Laboratory October 25, 1991. These tests have been performed in general accordance with accepted standards and checked with HLA's Quality Assurance Plan. This transmittal includes the following test(s):

12 Sieve Analysis to #200 Sieve

If you have any questions, please call me at (510) 682-7005. Thank you.


Edward F. Hinkson, Project Supervisor


Rev. By: Kenneth R. Criley, Laboratory Manager

cc:

HLA - LABORATORY PRE-INVOICE

CLIENT: Abu Dhabi

DATE: 10/31/91

PROJECT: VWR Boise

Standard Billing:

Special Rates:

ATTN: Michelle Watson

URN:

2847

PREPARED BY:

三

DATE RECEIVED:

10/35/91

© 2010 Kuta Software LLC

See Contract No.:

PRE-INVOICE TOTAL:

Checked/Typed By: *CJ*

Date: 11/11/91

Posted By:

Date: 11/11/91

Per'd By:

Date:

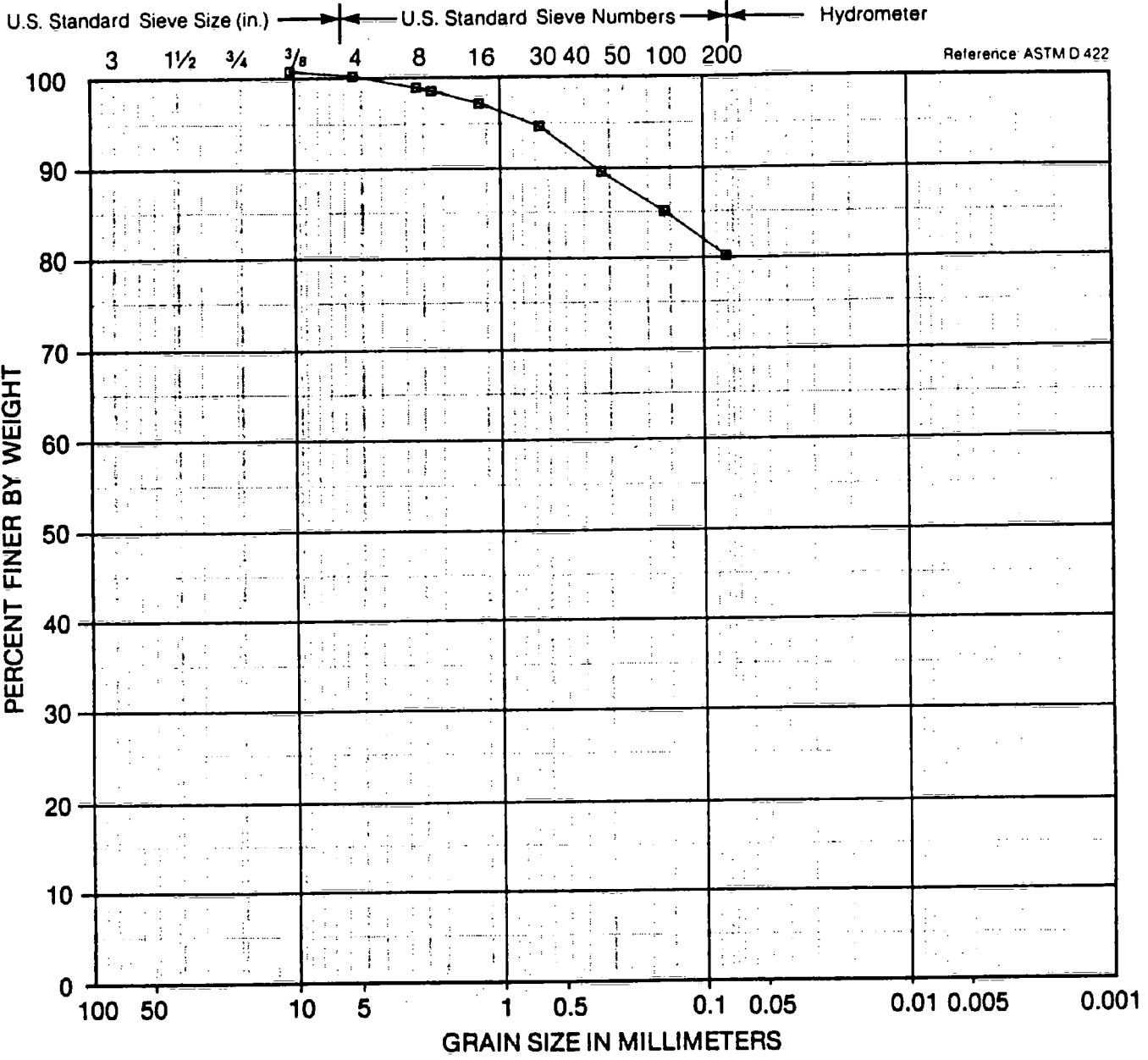
PROJECT: VW A Boise LABORATORY TEST REQUEST JOB NO.: 9645, 337, 02
 SUBJECT: DATE: 10/26/01
 DESCRIPTION OF PROJECT: Soil Borings BY: Michelle Watson
 WATER LEVEL: NEED RESULTS BY: 10/31/01 APPROVED:
 DATE TESTS ADDED: AGREED COMPLETION DATE: RECEIVED: Oct 10/25

BOR.	DEPTH	NAME OF TEST	✓	8 P.M. TO	INSTRUCTIONS	NAME OF TEST	NO.	PRICE	TOTAL
B-1	5.0	Grain analysis (MA)	✓		run grain analysis (MA)	M			
B-1	10.0		✓		on all Samples	MD (Regular)			
B-1	15.5		✓		(Change approved by 5/10/01 10/15/01)	MD (Special)			
B-2	4.5		✓		need result by	TX (UU)			
B-2	6.5		✓		next Monday (Wednesday if possible)	UC			
B-2	11.5		✓		possible	DS (CD)			
B-3	3.5		✓			Consol			
B-3	8.5		✓			Hydrometer			
B-3	11.0		✓			MA			
B-4	4.5		✓			Passing No. 200			
B-4	10.5		✓		all Sample have	PI			
B-4	14.0	✓	✓		Potential PCE	R-Value			
					Contamination - USE	Compaction			
					Conform Gloves or	LVS			
					appropriate hardware	Rel. Density			
						TX ()			
						Cyclic TX			
						Resonant Column			
						Permeability			
						Remold			
						Pinhole			
						Logging			
						Spec. Gravity			
						Organic Content			
					Contact Michelle	Ph			
					Gatson with results	Resistivity			
						Durability Index			
						CBR			
						Swell-Comp.			



CAUTION

CONTAMINATED SAMPLE



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			
■	B-1 @ 5.0 FT				YELLOW-BROWN FAT CLAY W/SAND (CH)	



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

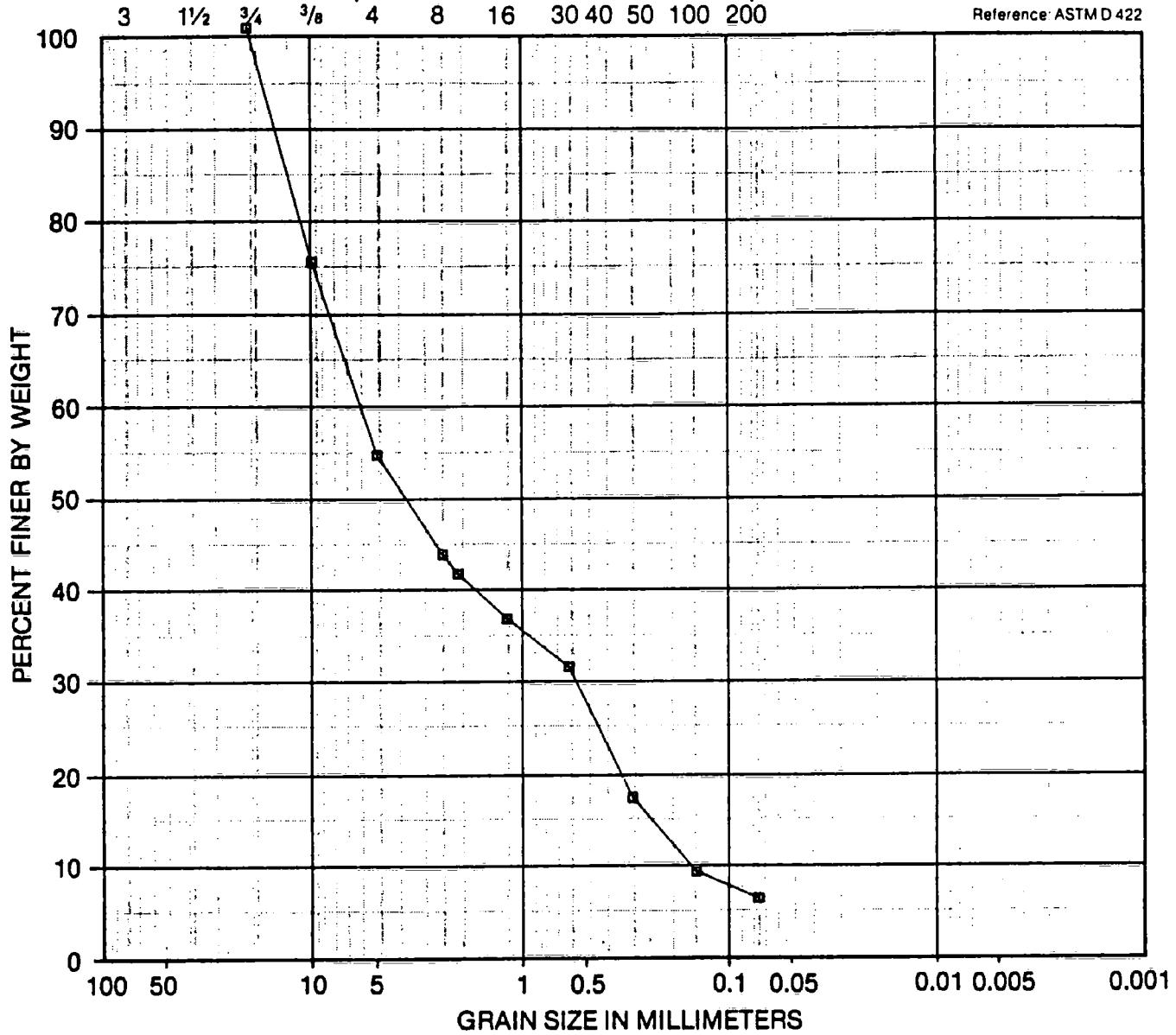
Particle Size Analysis

PLATE

DRAWN APPROVED REVISED DATE
JOB NUMBER 09696.337.02 DATE 10-30-1991

U.S. Standard Sieve Size (in.) ← U.S. Standard Sieve Numbers → Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
■	B-1 @ 10.0 FT	BROWN SAND W/CLAY AND GRAVEL (SP-BC)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

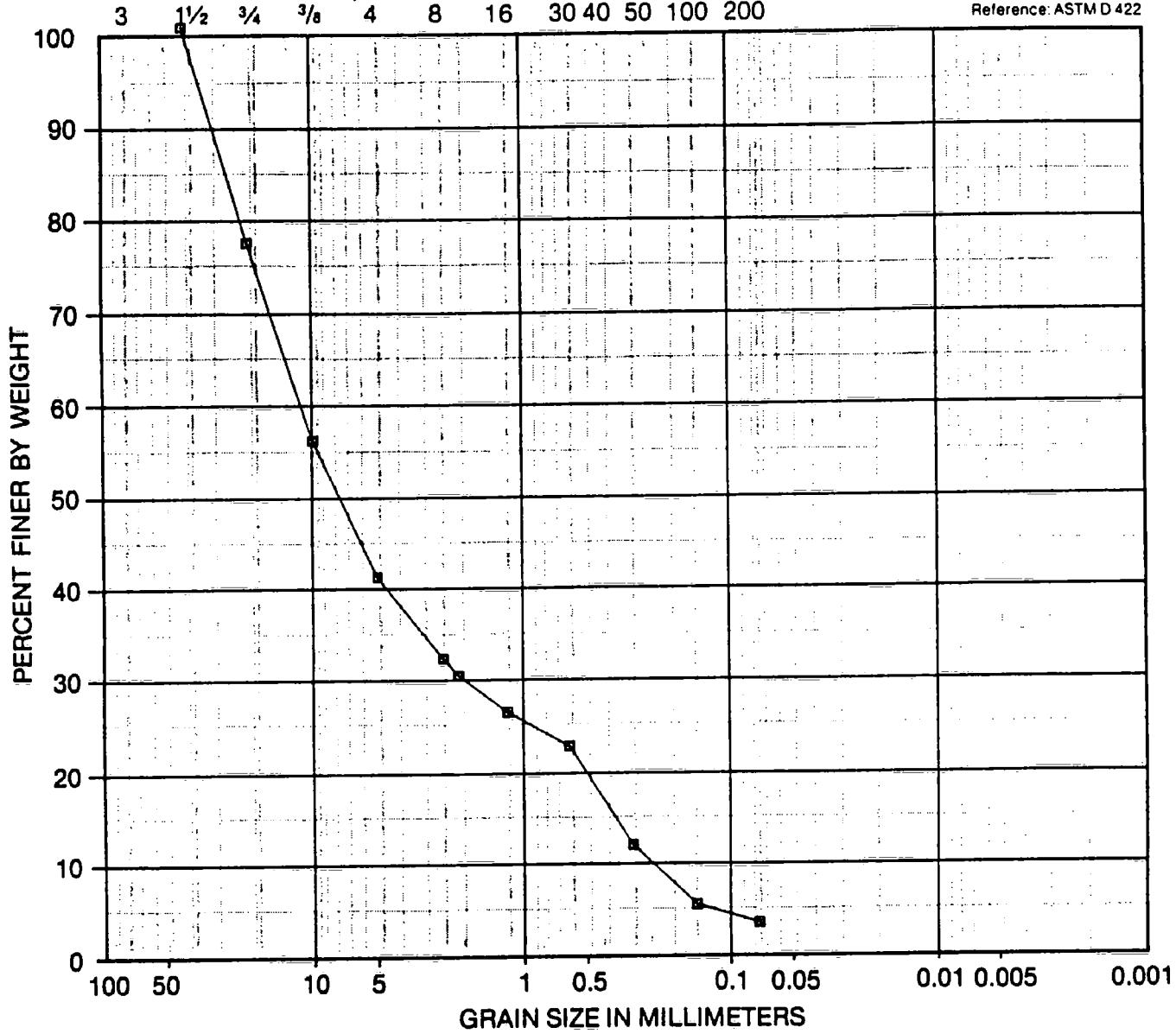
Particle Size Analysis

PLATE

DRAWN APPROVED DATE REVISED DATE
JOB NUMBER 09895.337.02 FCH 10-30-1991

U.S. Standard Sieve Size (in.) ← U.S. Standard Sieve Numbers → Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			

Symbol	Sample Source	Classification
■	B-1 @ 14.0 FT	BROWN GRAVEL W/SAND (GW)

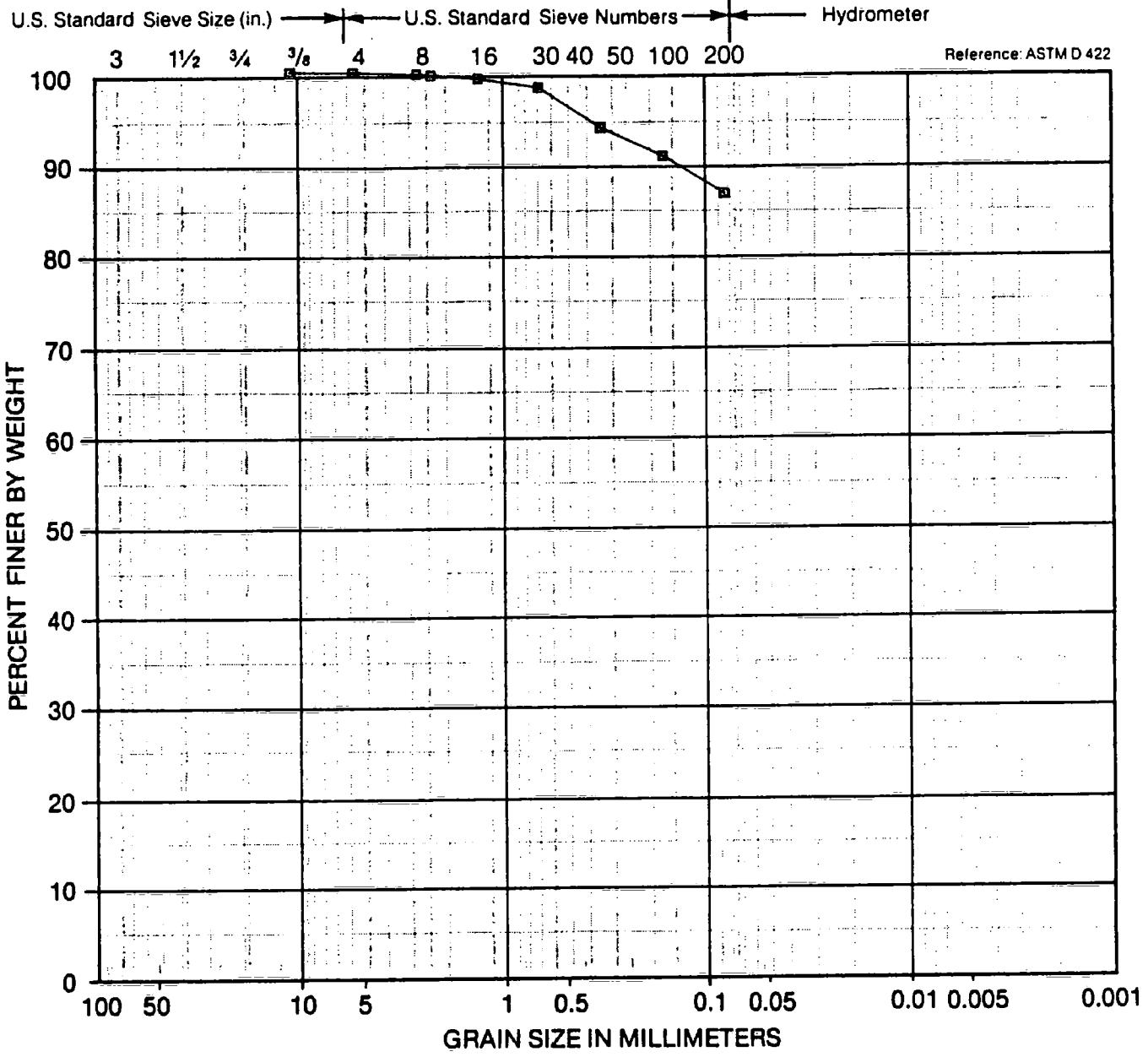


Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Particle Size Analysis

PLATE

DRAWN APPROVED DATE REVISED DATE
JOB NUMBER 09695 .337 .02 FCH 10-30-1991



Symbol	Sample Source	Classification
■	B-2 @ 4.5 FT	BROWN FAT CLAY (CH)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

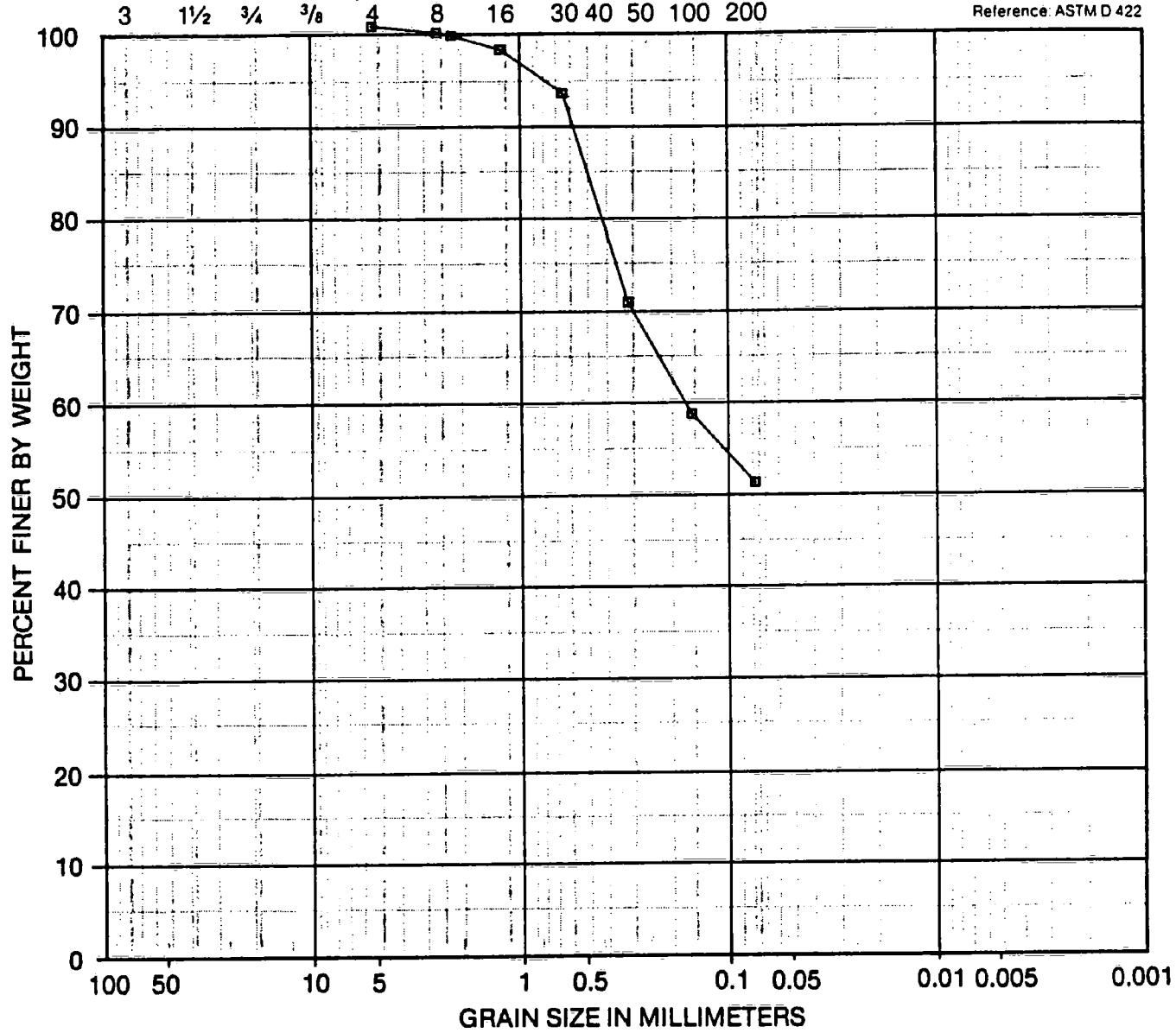
Particle Size Analysis

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	09695 . 337 . 02	<i>FH</i>	10-30-1991		

U.S. Standard Sieve Size (in.) ————— U.S. Standard Sieve Numbers ————— Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
■	B-2 @ 6.5 FT	BROWN SANDY FAT CLAY (CH)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

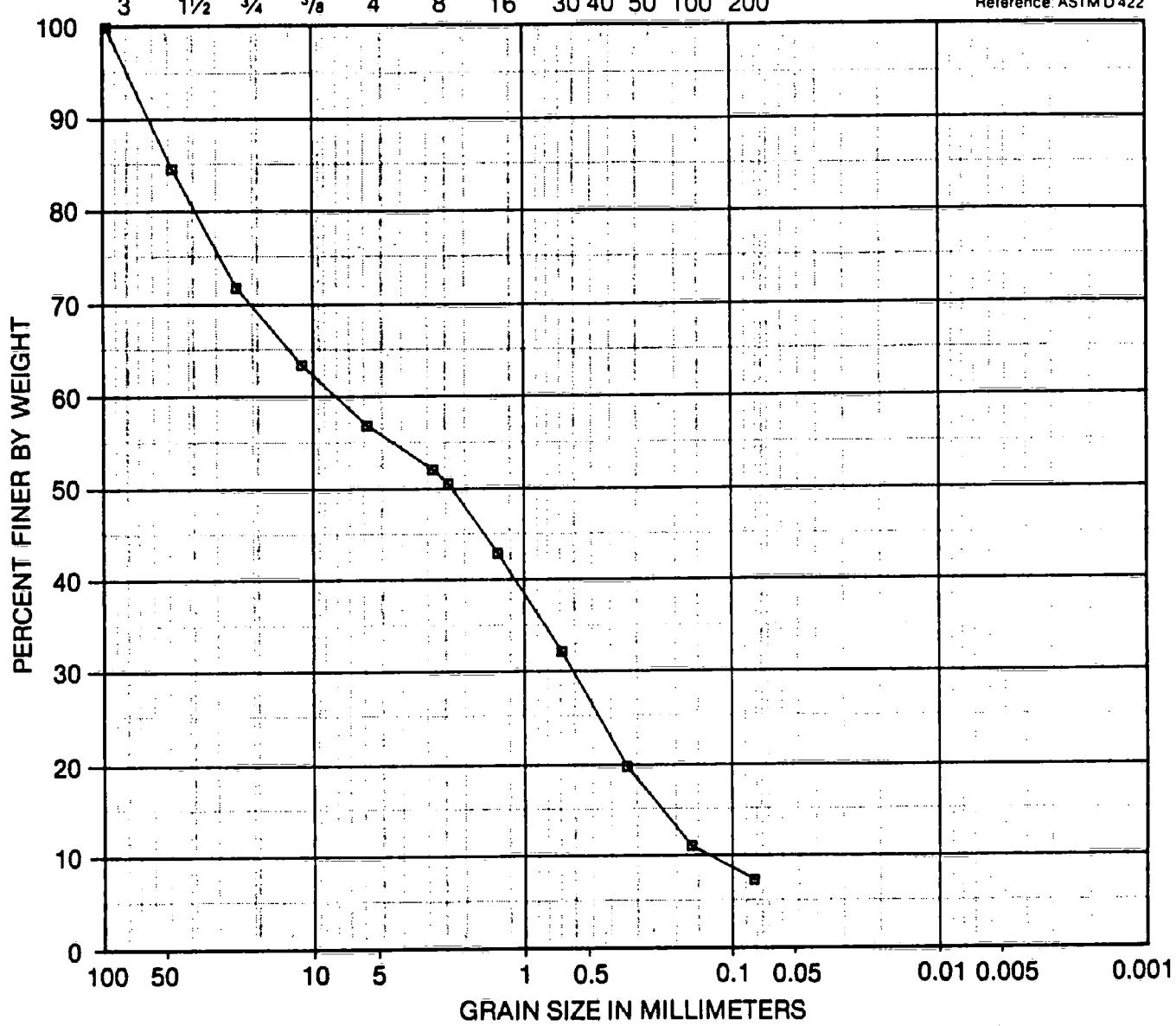
Particle Size Analysis

PLATE

DRAWN	JOB NUMBER 09695.337.02	APPROVED SPH	DATE 10-30-1991	REVISED	DATE
-------	----------------------------	-----------------	--------------------	---------	------

U.S. Standard Sieve Size (in.) → U.S. Standard Sieve Numbers ← Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			
■	B-3 @ 3.5 FT				YELLOW-BROWN SAND W/CLAY AND GRAVEL (SP-SC)	



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

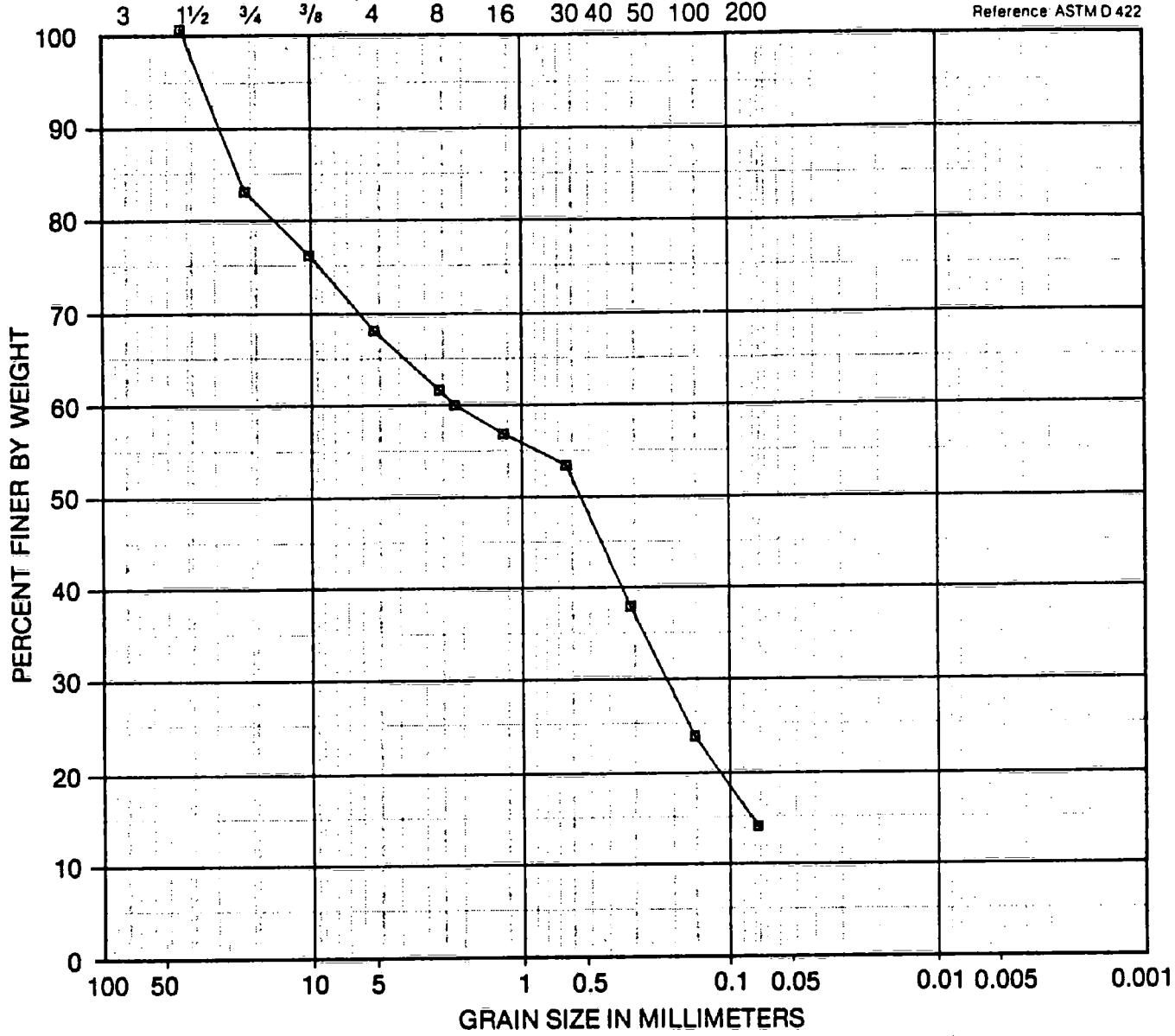
Particle Size Analysis

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	09695 . 337 . 02	HJ	10-30-1991		

U.S. Standard Sieve Size (in.) → U.S. Standard Sieve Numbers ← Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
■	B-2 @ 11.5 FT	ORANGE-BROWN CLAYEY SAND W/GRAVEL (SC)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

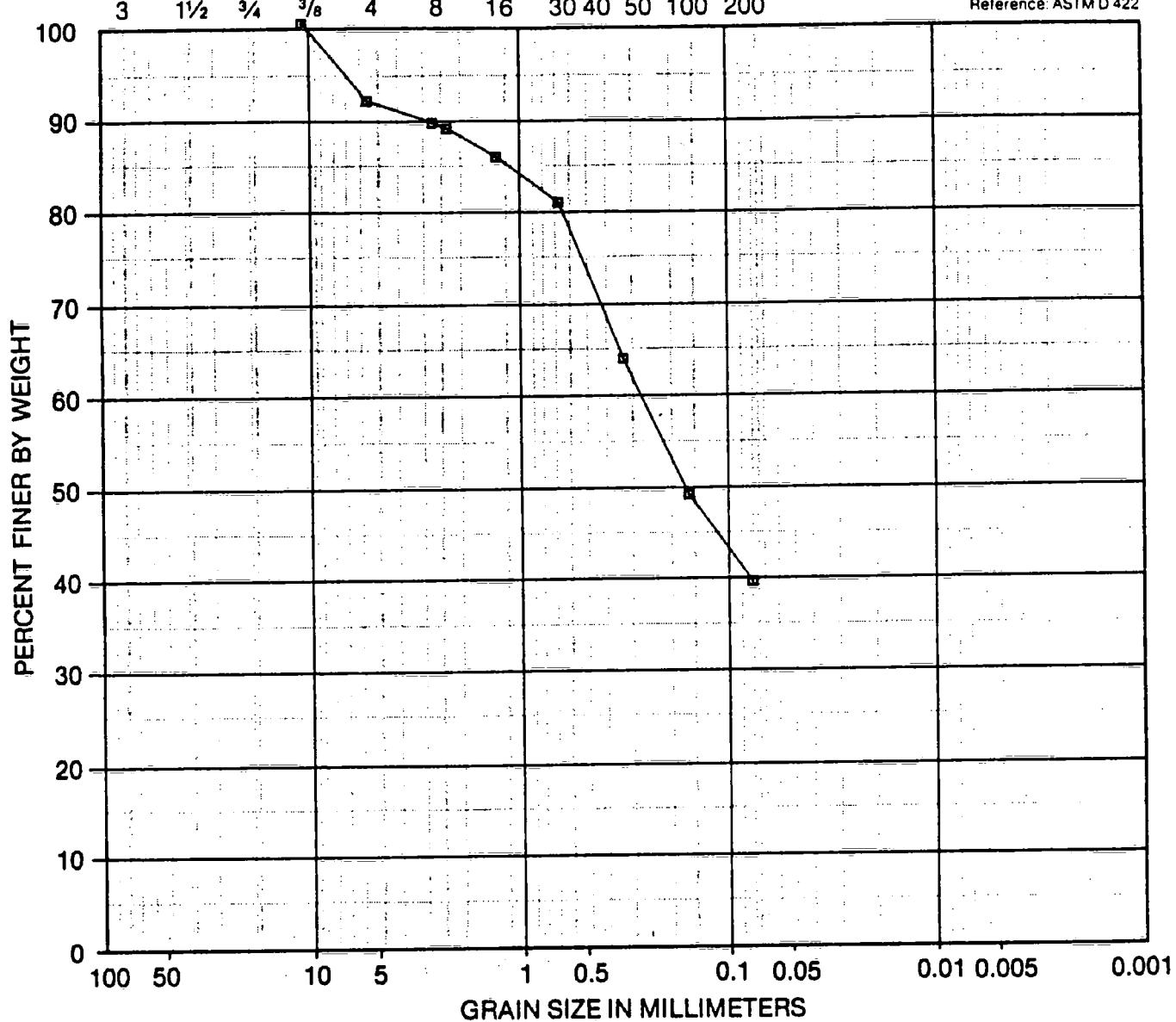
Particle Size Analysis

PLATE

DRAWN APPROVED DATE REVISED DATE
JOB NUMBER 09695 . 337 . 02 10-30-1991

U.S. Standard Sieve Size (in.) ← U.S. Standard Sieve Numbers → Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
■	B-3 8 8.5 FT	BROWN CLAYEY SAND (SC)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Particle Size Analysis

PLATE

DRAWN

JOB NUMBER
09695 .337 .02

APPROVED

PLA

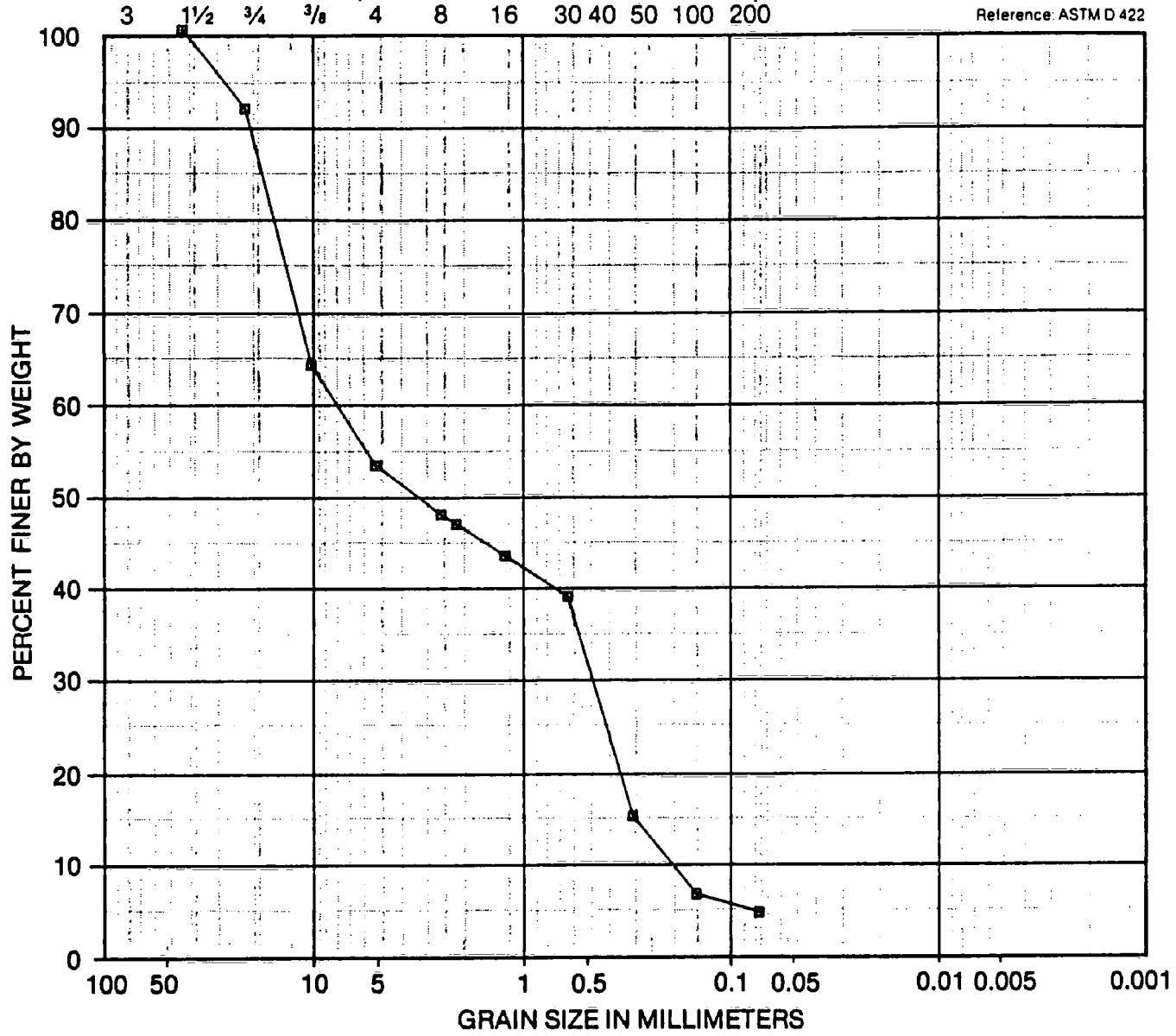
DATE
10-30-1991

REVISED

DATE

U.S. Standard Sieve Size (in.) ← U.S. Standard Sieve Numbers → Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
■	B-3 @ 11.0 FT	BROWN SAND W/GRAVEL (SP)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

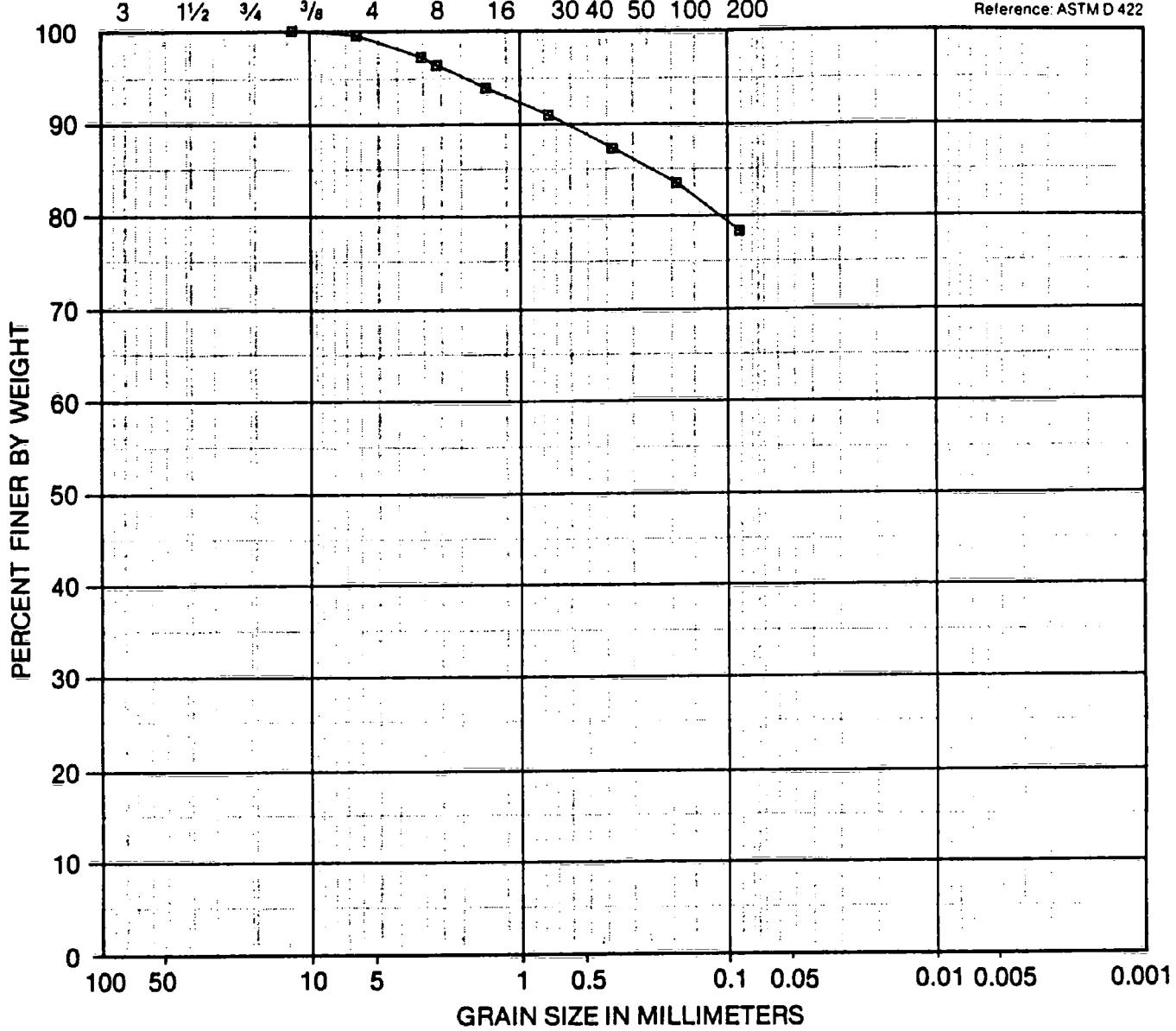
Particle Size Analysis

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	09695.337.02	ECH	10-30-1991		

U.S. Standard Sieve Size (in.) ← U.S. Standard Sieve Numbers → Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
a	B-4 @ 4.5 FT	BROWN FAT CLAY W/SAND (CH)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

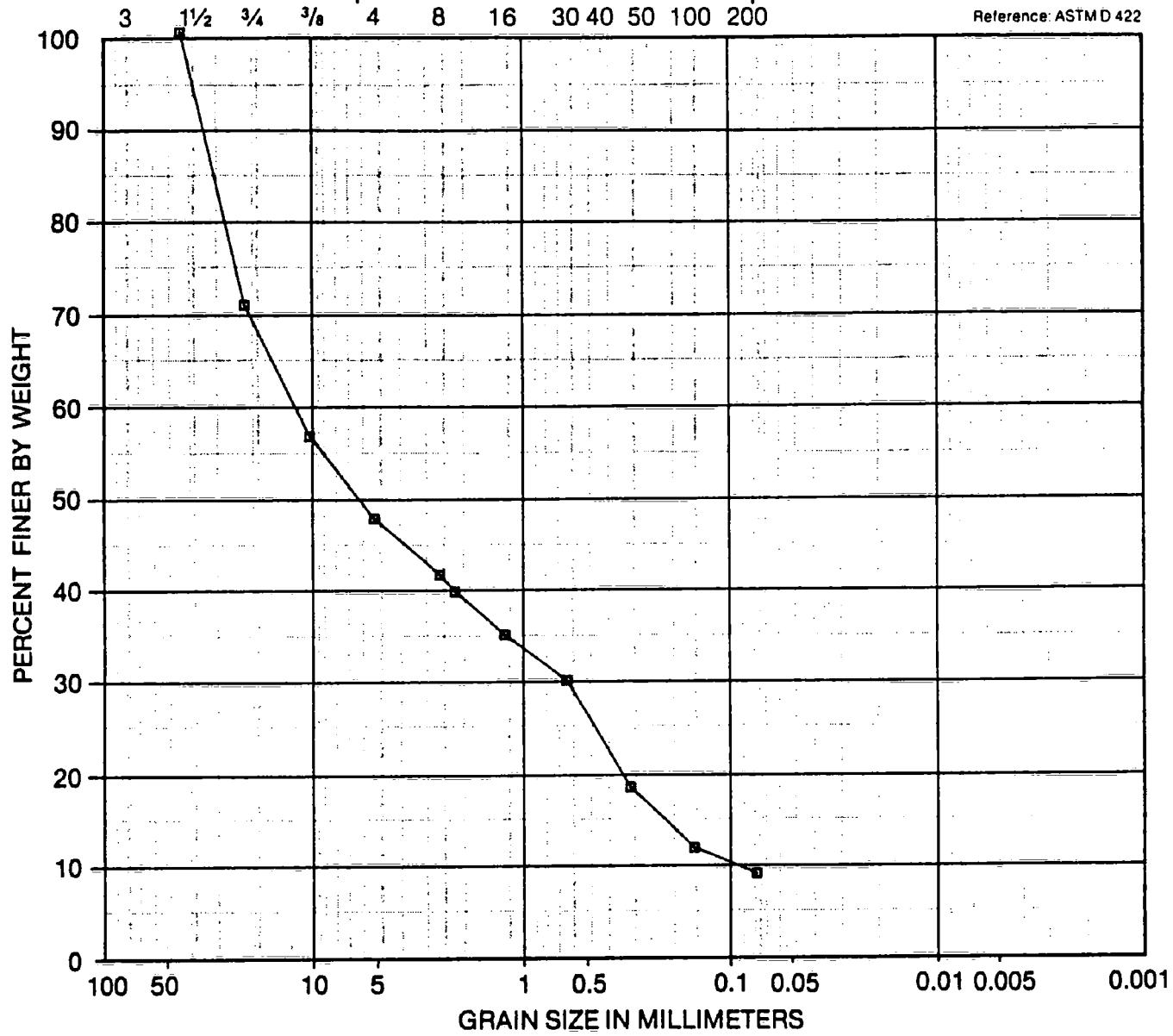
Particle Size Analysis

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	09695, 337.02	ABH	10-30-1991		

U.S. Standard Sieve Size (in.) → U.S. Standard Sieve Numbers ← Hydrometer

Reference: ASTM D 422



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL			SAND		

Symbol	Sample Source	Classification
■	B-4 @ 10.5 FT	BROWN GRAVEL W/CLAY AND SAND (GP-GC)

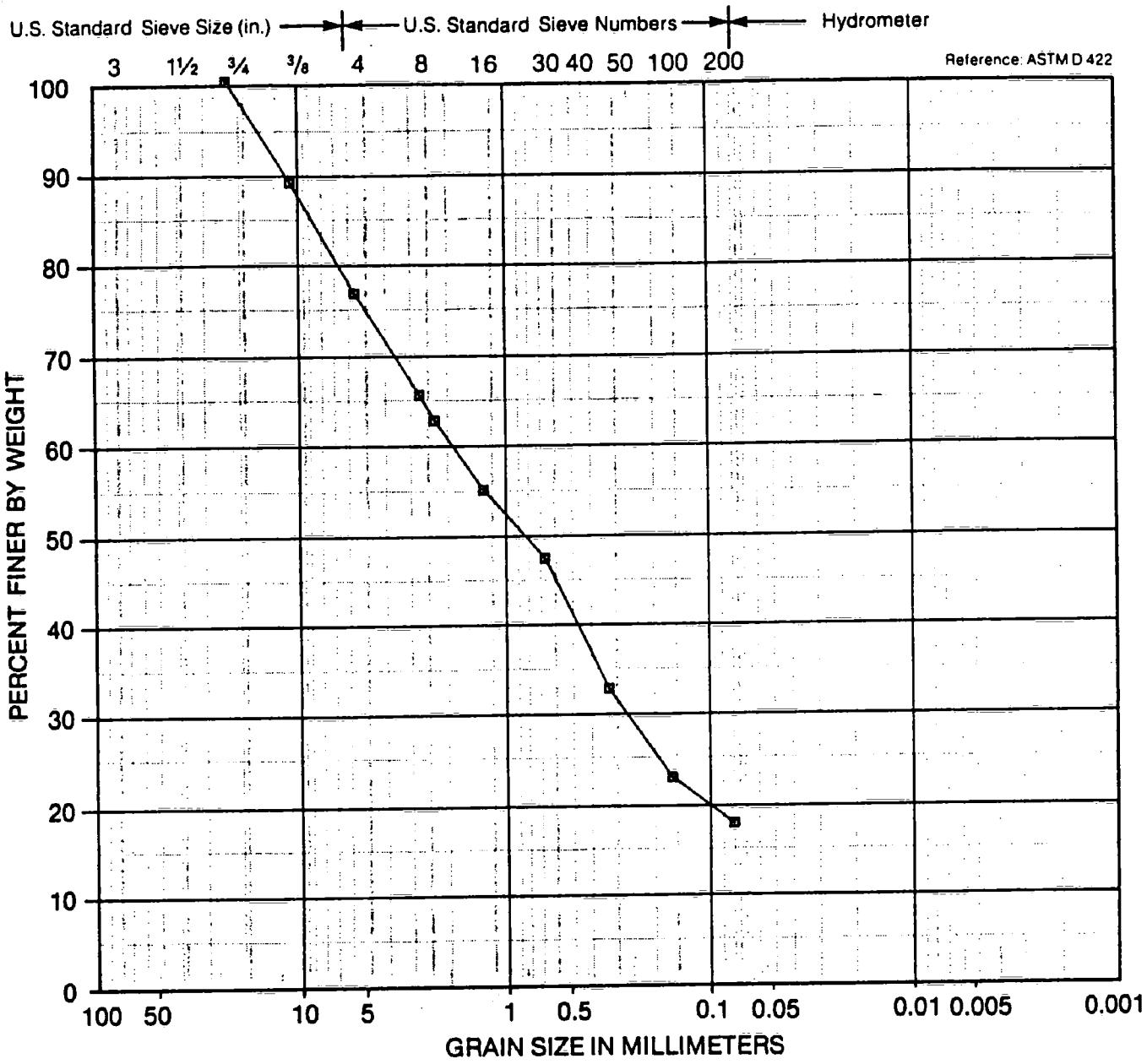


Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Particle Size Analysis

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	09695.337.02	FLH	10-30-1991		



COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			

Symbol	Sample Source	Classification
■	B-4 @ 14.0 FT	BROWN CLAYEY SAND W/GRAVEL (SC)



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Particle Size Analysis

PLATE

DRAWN	JOB NUMBER	APPROVED	DATE
	09695 .337 .02	HCH	10-30-1991
			REVISED
			DATE